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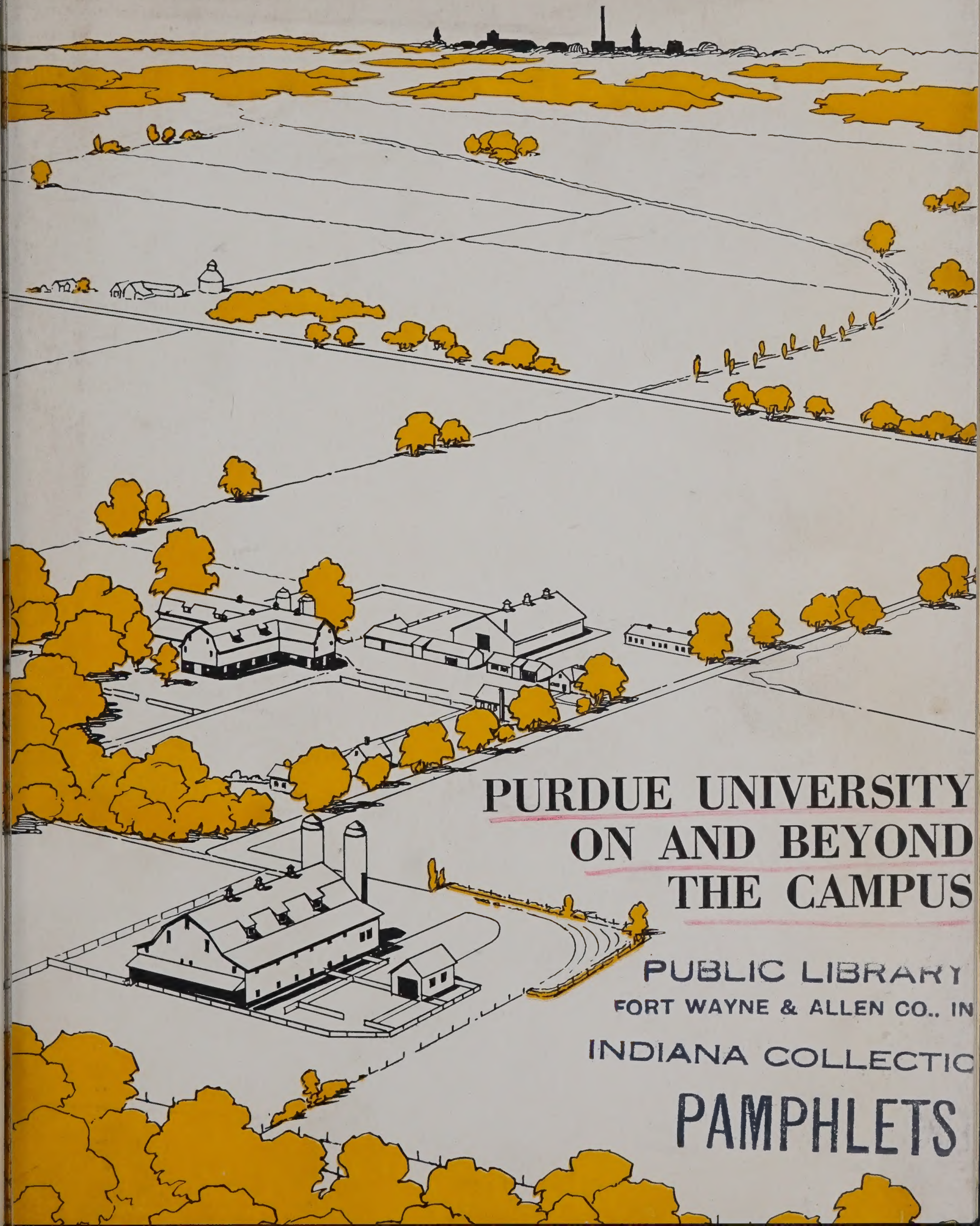

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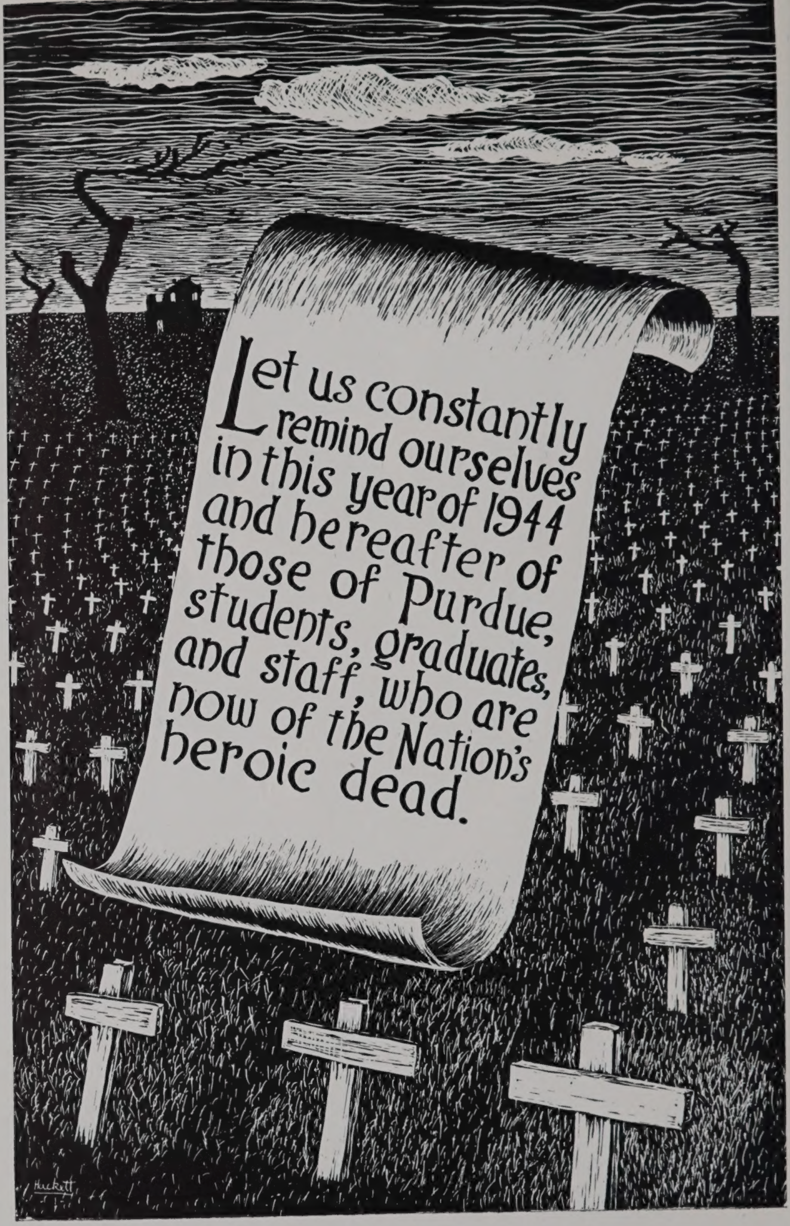
Let us constantly
remind ourselves
in this year of 1944
and hereafter of
those of Purdue,
students, graduates,
and staff, who are
now of the Nation's
heroic dead.
Huckett

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PURDUE UNIVERSITY ON AND BEYOND THE CAMPUS

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1943-1944

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LETTERS OF TRANSMITTAL

To the Governor of Indiana:

By direction of the Board of Trustees, there is transmitted herewith the annual report of Purdue University for the period July 1, 1943, to June 30, 1944. This report is commended to your serious attention. It contains the evidence of the stewardship imposed by the State upon the Trustees for the conservation of not the least of the institutions of the State.

Respectfully yours,
John A. Hillenbrand,
President of the Board of Trustees

The Honorable Henry F. Schricker
State Capitol
Indianapolis, Indiana

To the Trustees of Purdue University:

In accordance with custom, and in compliance with State and Federal laws, the accompanying report of the accomplishments and condition of the University for the year July 1, 1943, to June 30, 1944, is presented. Supplementary to this report there will be transmitted shortly the following special reports for the same period:

The Financial Report of the University
The Report of the Director of the Agricultural Experiment Station
The Report of the Director of the Department of Agricultural Extension
The Report of the Auditor of Student Organizations

The present report digests and summarizes the detailed reports submitted by the heads of the several offices, schools, and departments of the institution. As was the case with the distinctive report of last year, the difficult task of selecting, assembling, and editing the material has been accomplished by Professor R. W. Babcock, the University Editor.

The illustrative maps on the inside of the cover and the drawings before each section of the report were drawn by Clarence G. Hackett, now teaching in the Naval Electricians' Mates School. The cover, showing one of the experimental farms—the Lynnwood Farm—in the foreground and the University in the distance, was drawn by Lloyd Moser. To both is due gratitude for making available to the University their genuine artistic talent.

By means of this report the University strives to secure, especially on the part of the responsible leaders, a better and fuller understanding of the efforts of the University to contribute to the forward-looking and forward-moving civic and economic life of the State. To this end the special emphasis of this year's report is upon those services rendered beyond the campus. For Purdue, more than ever before, has become a state-wide and a state-working agency.

Responsibly yours,

EDWARD C. ELLIOTT, President

THE PRESIDENT'S FOREWORD AND FORECAST

I

For the third year the University has continued to exercise a vigorous will, developed during the seventy years of its operation, to serve the demandful and tragic days of the war; and at the same time to conserve those interests essential for the days ahead, whether they be days of extended war, or the yet more critical days that will separate war and peace. The notable characteristic of the year has been the devoted attention of all the officers and members of the staffs and of the students to the serious tasks assigned to the University. Only from the inside is it possible fully to appreciate the heavy drafts upon physical strength, professional skill, and patriotic spirit necessary to keep the University in productive activity on an all-year schedule. Yet this has been done, and in ways yielding more than the customary satisfactions.

II

The compelling absorption in the day's work has not prevented a repeated and reverent recalling of the heroic service and sacrifice by those of the University of the past and of the present. At the Memorial Day exercises on May 28, 1944, the names of seventy-five alumni and students who had died during the year while in the armed services of the Nation, were read and entered upon the enduring Purdue records. Our war sacrifice total has now reached one hundred and thirty-eight. From this will come a heritage of idealism certain to affect the lives and civic attitudes of the future generations of students.

III

The death of the President of the Board of Trustees, Mr. James W. Noel, on April 6, 1944, was a serious reduction in the plus power of the University. For twenty-seven years, as a member and officer of the Board, he had served his alma mater with rare devotion and alert insight. Men of his stamp give a vital reality to democratic institutions of higher education.*

On June 28, 1943, the career of Mr. David E. Ross, long-time trustee and generous patron of the University, came to a close. By action of the Board of Directors of the Purdue Research Foundation, Mr. Fred C. Kelly is now preparing a memorial biography of Mr. Ross. It is expected that this will be published shortly.

IV

During the year more than 12,000 different students received instruction on the campus. The number of degrees in course granted was 1,045. Eight honorary degrees were conferred.

Because of the complications and overlapping of the all-year operation, it is not possible to prepare a census of the student population for the year that fits the pattern of statistics of former years. The detailed and classified figures of students enrolled in regular University classes are in the summary of the Registrar's report included in the Appendix of the present report. These figures show that the total number of individual students during the year April 20, 1943, to June 30, 1944, whose records are kept in the Registrar's Office, was 9,310, as compared with 8,359 in 1942-1943. It is to be observed that, of this number, 9,002 were resident students, and 1,834 were women. This number includes the regular civilian students, those in the Army and Navy Specialized Training Programs, the Curtiss-Wright and the Radio Corporation of America Engineering Cadette Programs, and the Agricultural Winter School.

Other important groups of students were instructed on the campus. Among these were the students in the Electrician's Mates School of the Navy (2,103), the Naval Flight Instructors School at the Purdue University Airport (845), and the students from the South American countries being trained at the Airport for civilian air pilot service (40).

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* See *A Book of Tributes to James William Noel, Trustee of Purdue University, 1917-1944* (published by the University).

V

The teaching of the University is but incompletely represented by the numbers of students indicated above. To these at least another 12,000 should be added—those attending the fifty-two short courses, conferences, institutes, etc., held on the campus. The final total of the teaching by the University staff must also include the thousands taught away from the campus. In the off-campus student population are to be found those enrolled in the Engineering-Science-Management War Training programs, numbering during the year approximately 10,300 students in 544 classes; the 216 students in the Technical Institutes now organized in Indianapolis, Fort Wayne, and Calumet; the 3,000 individuals trained through the special schools conducted by the Public Safety Institute—police, fire, and industrial plant protection. Thus, more than a third twelve thousand are to be placed in the student column. There is yet another important addition to this accumulated total of 36,000. The more than 50,000 young men and women organized and taught in the 4-H Clubs of the State, and the more than 150,000 farm people regularly attending the schools, institutes, demonstrations, and clinics held throughout the State, are to be regarded as belonging to the learners of the University. When one includes also the press service of the Bureau of Information and the work of Radio Station WBAA, it may be truly said that the University teaches around the clock, around the year, and around the State.

VI

The principal part of this annual report is rightly concerned with the record of the immediate past. However, by its nature the University of the present must be even more concerned with the future—the future of its students, the future of itself, and the future of the democratic society for which it exists and by which it is controlled. Never before has it been more difficult to read the signs of the present and to gain any clear understanding of the work to be done in the days ahead. At the moment, the world is in the midst of the tragic and destructive fury of war. How long this is to continue is beyond our knowing. Yet, the task of being ready for a "cease firing" order, whenever this is given, may not be disregarded. Indeed, certain after-war tasks are already here.

The enactment of the Servicemen's Readjustment Act in June, 1944, with its unprecedented provisions for educational opportunities for men and women honorably discharged from the armed services, places upon the University a series of new duties. A number of such veterans already have been admitted. The staff is giving continuous serious attention to those modifications of educational procedures that will enable the University most effectively to fulfill its new obligations. It is fully realized that technical education is confronted with problems of reconversion as far-reaching in their consequence as are those of industry and government.

In this connection the University is not unaware of the momentous changes in education and in American life that would result from the possible adoption of a national plan of military training for youth.

As evidence of the University thinking and University planning for the future, the following critical items are now under serious and constructive consideration:

1. *The professional improvement and economic stabilization of the instructional corps.* This is a prime and immediate responsibility of the University administration. Higher qualifications for initial appointment and for promotion are necessary if the University is to maintain its rank among American technical institutions. Likewise, the responsibility for the continuous adaptation of the content and method of teaching to an ever-changing technology, and consequently to individual and social needs, must be recognized by all members of the staff. The evidence of long experience clearly indicates that progress to these ends would be speeded by the placement of all members of the teaching staff on an all-year service basis. This annual service would be allotted to teaching and to periods of study, practical experience, the opportunity for maintaining physical fitness. The prevailing idea that the members of the teaching staff are part-time workers, to be compensated for nine or ten months of service each year, must be abandoned.
2. *The enlargement and improvement of the physical facilities.* These facilities include buildings, scientific and educational equipment, and library. Today, men and women of professional competency and ambition are not content to work with inadequate material resources. A conservative estimate shows that, if Purdue is to maintain its place among

American technological institutions, provisions for an expenditure of not less than ten million dollars must be made during the next five years.

3. *The extension and betterment of living accommodations for students.* In the annual report of twenty years ago this was listed as a major need. Notwithstanding the construction of the residence halls for men with rooms for 1,000, and for women, 400, the steady rise in attendance has served to attach an increased importance to this need. Conservative estimates point to an after-the-war attendance of ten thousand. It is important that the plans for meeting the enlarged needs take fully into consideration not only the volume of the needs but also the changed character of the needs. The plans will need to be based upon the assumption that halls for student living are something more than the means for furnishing essential and economical shelter and subsistence. More and more these student residence halls must be utilized as means for student character education. Life in the halls must come to have moral values as well as physical advantages.

   Furthermore, the plans of the University may not disregard the growing pressure for adequate housing for the younger members of the staff, married and unmarried, and for graduate students engaged in part-time teaching. This is a distinctive and unmet need.

Hackett

The University On the Campus

An annual report of a university should resemble the daily, routine record of a healthy organism: it should be repetitive and hence perhaps monotonous. The notation "no change" indicates the continuance of well-being. The human organism, it has been said, is completely replaced every seven years. Growth and health imply constant minute alterations throughout the entire fabric of being. And so with a university: the health chart becomes interesting only when abnormal conditions are reflected by such a symptom, for instance, as an accelerated pulse rate.

The years 1942 and 1943, it is needless to point out, were filled with exceptional demands, to which the University organism responded. To continue the analogy, the University's changed academic year resembled an accelerated pulse rate: the rhythm of University life was radically changed in frequency of matriculation of new students and of graduation of those who had completed their formal education on the campus. It may be also that a rise in temperature has been shown in a somewhat hectic activity among the staff and the students, both in and out of the classroom, on and beyond the campus.

One of the obligations of continued life for any organism high in the evolutionary scale, however, is the ability to adjust to abnormal conditions. During the year 1943-1944, Purdue University has proved its adaptability. Its staff and its students have dropped into the pace of wartime living, and its annual record is therefore less interesting. If we may change the metaphor abruptly, the University reached the rim of the plateau and, since, has been going steadily along toward an horizon not yet distinctly visible. But this striding over the level land by no means implies complacency and overconfidence. In its struggle to adjust, the University occasionally met an insurmountable obstacle and had to retrace its steps. Some weariness was inevitable; and the plateau of possible achievement it has reached is so broad that the course to be followed must be carefully charted and constantly checked.

KEEPING PACE

This section of the annual report of Purdue University will, as evidence of continuity and well-being, tell something of the routine activities of the University. Routine in such a university implies a belief in at least considerable competence, but it also includes continued educational experimentation to increase this competence. Furthermore, the effort to continue the routine of its normal existence during unusual times is essential to successful adjustment. Consequently, great gaps may appear in this report; many of the teaching departments may, fortunately, report "no change."

This section will also describe some of the unprecedented situations to which the University was becoming adjusted. It will make an accounting of those that have been discontinued and tell of new. It might be entitled "Changes and Adjustments: Present Conditions and Future Planning." The remaining sections of the report will tell of what is recognizable as real accomplishment.

Curricular Additions and Changes. The most significant addition to the curriculum of the University is an evidence of the University's effort to meet changing educational needs in a changing world. There has been approved a four-year curriculum that will lead to the degree of Bachelor of Science in Flight Administration. This course of studies, which will not be available to students until the University airport facilities are no longer needed for war-training programs, will provide skilled men and women for the operational activities of the aeronautics industry. Students who have completed two years of satisfactory work in a recognized college or university and have met certain minimum requirements of mathematics, chemistry, and physics will be admitted as juniors and will be awarded the degree of B.S.F.A. after successful completion of four terms of work.

The establishment of such a curriculum means more than the recognition of the expansion of aviation as a result of the war: it reflects also a trend of probably more far-reaching consequence. Heretofore, business in the United States has tacitly assumed that the qualities necessary for successful management and administration are somehow acquired by those who "get in on the ground floor and work up." Now it is becoming apparent that successful management requires training as much as does any other profession.

This concept is reflected likewise in the interests of many students. The Department of General Engineering reports a marked growth in management subjects even in this period characterized by fairly rigid programs defined by the Army and the Navy. The number of students electing management courses has rapidly increased. This interest is not limited to Navy men taking engineering curricula, for an important proportion of other students, women as well as men, are concerned with the application of management techniques to other fields than engineering and industry. And this increasing concern is not confined to the campus, for about one half of the Engineering-Management-Science War Training Program is devoted to management courses. Since the students of these ESMWT courses are already employed, this interest may indicate merely their ambition for promotion. Even though that may be so, it is clear that the methods of advancement in industry are changing; and surely management in the future will reflect many of the ideas inculcated in these courses, a thought sobering to the teachers.

Another move likewise shows the University's efforts to keep abreast of altering needs and changing interests in education. The courses in government and geography, hitherto taught in the Department of History, Economics, and Government, will hereafter be administered in a separate Department of Government and Geography. But this is not merely an administrative change: it will allow for an expansion of the field. A number of new courses will be offered, and the staff teaching them will be enlarged. Eventually there will be organized so-called regional courses dealing with the various areas of the earth. The political isolationism of many Americans has been due, in all probability, to an ignorance of geography. But this global war has shocked many people into a recognition of their lack. One of the healthy signs of a growing-up is a confession of ignorance and a determination to remedy it.

A resolve to remedy another such ignorance is the establishment of a new curriculum in modern housing, directed co-operatively by the Schools of Engineering and the School of Home Economics. The research done in housing, described later in this report, has shown clearly that few people in this country have any understanding of the real problems of modern home construction. If, after this war, hundreds of thousands of comfortable, low-cost houses are built, there will be an unfillable demand for people who understand the making of such homes contribute to the well-being of our people.

If there is a relationship between curriculum and educational service, then the short courses reported by the School of Agriculture should be mentioned in this section. It has long been the purpose of the School to provide technical training in agriculture in whatever field was needed, a doubly important service in the war period. Such special training has been offered in two-weeks short courses in poultry husbandry, two- and three-day courses in grain grading, and a new course in cartography, in agricultural engineering, offered for navy and marine students taking engineering work. Furthermore, the School has developed a new course in rural housing, which was offered for agricultural extension people from many nearby states during the summer of 1944.

It would be impossible to mention, except by mere listing, all the other minor changes made in the general University curricula. They are the constant mutations and modifications that bring about the proverbial seven-year replacement of an organism. However, in several of the Schools of Engineering the introduction of the Navy College Training Program and the expansion of the Army Specialized Training Program in July, 1943, accelerated the rate of change. Since these plans did not synchronize with the regular civilian-student programs, radical adjustments were required. Some innovations have been, or will be, merely temporary; some transmutations will prove themselves valuable and permanent. The citizens of Indiana and all those elsewhere interested in Purdue may be confident that the struggle of the University to make its educational services fulfill its recognized purposes will continue.

Just one more bit of evidence of this adjustment will be given. Heretofore, only freshman and sophomore women have been required to take any sort of physical education. The expanded activities of women have now shown that every woman who expects to be a useful citizen must keep herself in sound physical trim. Consequently, the requirement for physical education has been extended to include the junior women. The courses will be in the form of a recreational program, in the hope that these young women will learn so much of the pleasure of physical well-being that they will want to make some health-perpetuating sport part of their living habits.

Educational Experimentation. Educational experimenting is part of the normal and continuing function of the University. In these last two years of increased and more continuous teaching load, however, there has, apparently, been somewhat less of formal experiment. Nevertheless, of course, every teacher is constantly trying out new methods, making new approaches, both to his subject matter and to the interest of his students. And a committee of the University, the Committee on Superior Students, has made an effort to discover some of these new approaches and to correlate them so as to make them helpful to other teachers. Those not engaged in teaching perhaps feel that the genuinely superior student is less of a problem than are those who are not so highly endowed. The conscientious teacher knows that that is not so. One of the purposes of good teaching is to convince the students emotionally that one of the greatest pleasures is the use of the mind to its maximum capacity. Since, in any class, the capacities of the students vary, the constant danger is that the one with high ability may find himself unstimulated and therefore bored and perhaps resentful. What is interesting and stimulating to those of lesser capacity is to him what he would call "old stuff." Yet, for a superior intellect never to recognize the joys of intellectual activity is a major tragedy.

The Committee on Superior Students sent out to the faculty a questionnaire to try to discover if there were certain practices and devices used by good teachers in dealing with superior students. The report on that questionnaire is reprinted verbatim because the statement that "the results are not worth publishing and distributing" is too modest.

> The appeal to the faculty for information and suggestions concerning treatment of superior students brought such a meager, trifling response that a unified and coherent summary of "practices and devices" is not possible. Many successful teachers did not reply at all. Perhaps the best teachers distrust questionnaires, the mimeograph, statistics, generalizations; perhaps the appeal was ineptly worded or for some reason unattractive. At any rate, the results are not worth publishing and distributing. For you and your committee, however, I list the suggestions received:

1. Professor A: The grade of 6 should require no extra work—only superior performance in work assigned to all in the same class.
2. Professor B: The fast worker of problems is rewarded by having extra problems assigned to him.
3. Professor C: Pertaining to graduate students only—engaged in research: Helpful personal guidance, informal and democratic staff discussions, various attempts to avoid narrow-minded interest in only one field.
4. Professor D: "There are no best students."
5. Professor E: It is worthwhile to discover the student's constructive hobbies, turn this interest into the more adult channel of genuine scientific research, listen courteously to his suggestions, and encourage curiosity and self-confidence.
6. Professor F: Frequent conferences, discussion of topics (not necessarily connected with the course) student is interested in, recommendation of books, encouragement of each student to pursue his own intellectual hobby.
7. Professor G: Emphasis on special reports, each student writing on topic of especial interest to him; dangling before the student the prospect of reward for superior work.
8. Professor H: There are no devices. The teacher must be enthusiastic, humble (not pretend to be omniscient or stray from the subject matter of the course), able to show students the relationships among "courses".
9. Professor I: Encourage individual research, develop a professional consciousness, suggest additional projects.
10. Professor J: Interviews. advice on electives and activities, assignment to part-time work on research and instructional projects, etc.
11. Professor K: Tries to use orientation scores intelligently; acquaints himself with student's previous scholastic record; arouses thrill of learning by encouraging solution of some scientific problem; acquaints himself with student's vocational interest. Proposes wider use of privilege of establishing credit in basic courses by examination, and suggests that we should define a bachelor of science degree in terms of demonstrated achievement rather than in terms of time served.
12. Professor L: Better students are assigned extra, difficult problems.
13. Professor M: The teacher should make his profession an art, an individual art (it can't be learned through "pedagogy"). Only by abundant enthusiasm and thorough grasp of his subject can a teacher inspire. He must avoid sarcasm, profanity, discourtesy.
14. Professor N: The teacher must tactfully shame the student out of indolent habits, praise him always when praise is due.

15. Professor O: The teacher must become personally acquainted with the superior student, know him socially if convenient, find out his intellectual interests and not only direct him to the great books but inspire him to read them and talk about them after he has read them.

This report is significant by very reason of its failure to discover "practices and devices." The use of practices and devices is too liable to become habitual, and what becomes habitual is stultifying. Furthermore, their use is too likely to imply complacency in the teacher. The significance of these replies is that each shows that the teacher is not confident and is therefore continually trying to solve what are ever-changing problems. No superior student is just like any other, and the effort to understand him as an individual is preliminary to interesting him.

If we may assume that these replies came from fifteen of the better teachers, then we may believe that they are trying to realize, on the campus of a great university struggling to fulfill the ideal of the democratization of learning, the proverbial advantageous position of Mark Hopkins astride one end of a log and a student astraddle the other.

The Experimental Curriculum for Women. About five years ago a special experimental curriculum was organized for a group of selected girls. The aim of that curriculum was to liberalize the scientific training offered here so as to give those enrolled a broader view of the function of science in the modern world than can be inculcated in those who are specializing in the somewhat narrower technical training that will fit them for particular jobs. The courses in biology, chemistry, physics, and mathematics offered in that curriculum, for example, stress not the minutiae of technology but the interrelationships of those sciences with all of life. Now the first two groups of women enrolled in that liberal science curriculum have been graduated from the University, and the work that some of them have found to do, and do successfully, furnishes interesting evidence of the success of this new educational approach.

One of the first group, who received her degree in 1943, was, in September, 1943, appointed to a committee established by the State Department in Washington to do specialized research in connection with its wartime activities. Another has been employed by a newly-elected congressman to act as his research assistant. Still another, who is preparing herself to be a patent lawyer, has already been made an associate member of a law firm and is finding that her knowledge of the sciences is a most valuable aid in present-day legal practice. Yet another of that class is an aerodynamicist employed by the Hamilton Propeller Company.

Of the second group of graduates, one has been appointed director of the Wesley Foundation at a state college; another is a junior engineer in the aircraft radio laboratory at Wright Field; and a third girl is a physicist for the Eastman Kodak Company. This last example is especially interesting, since it shows that the broad training she received in lieu of a special technical discipline has not prevented her being successful in a specialized scientific field.

From the scientific point of view, this special curriculum proves little as to the general usefulness of such an educational approach, for the girls admitted to the course are especially selected and therefore presumably especially fitted to profit by it. Educationally, however, the setting up of the curriculum proves much about Purdue University. It indicates that the University is neither self-satisfied nor static. Recognizing that the standardized curriculum, following rather closely the comparatively narrow directions laid down by the Land-Grant Act, could not satisfy many of the demands of a world that has changed, both in its values and in its needs, since the passage of that Act, the University was willing to strike out boldly. It has attempted to correlate some of the values of the traditional liberal arts college with some of the indubitable values of a technical school. Indeed, one who has been on the campus of Purdue University for twenty or twenty-five years must feel that the chief evidence of the health and growth of the University is this trend. A land-grant college devoted to the teaching of the agricultural and the mechanic arts, the University has, nevertheless, steadily approached closer and closer to realizing the true meaning of the word *university*. More and more the University can say that its graduates are not engineers, agriculturists, scientists, or pharmacists, but educated men and women.

The Division of Educational Reference. More than fifteen years ago the University set up the Division of Educational Reference, awkwardly so called to indicate that to it were to be referred various educational problems for experiment and possible solution. In these fifteen years it has investigated many matters at the primary, the secondary, and the college level of education. Under its guidance a number of graduate students have made interesting and some important researches, and the high schools of the state have profited greatly by its testing service.

During the past year much of the energy of the Division has been devoted to the constructing and analyzing of tests used by the Army and the Navy in connection with their specialized training programs. The Director of the Division was appointed Director of Region Five for the so-called A-12 V-12 Qualifying Tests for Civilians, the purpose of which was to select the young men from high-school graduates most capable of benefiting by the college training programs. Region Five comprises the states of Illinois, Indiana, and Kentucky; and during the past year about 30,000 young men between 17 and 21 took the tests in more than a thousand schools. The Division had the responsibility for the distribution, scoring, and other processing of the test materials, obviously a major job.

Furthermore, in July, 1943, a contract was signed with the War Department under which the Division assists in constructing and validating objectively-scored achievement tests in various subject matters of the Army Specialized Training curriculum, Purdue University being one of only seven universities chosen for this work. The tests were compiled by subject-matter specialists in ten departments of the University, with the Division acting in a consulting and supervisory capacity. The tests were given at the close of the summer term in September, 1943, and of the fall term in January, 1944. At the September testing 2,500 tests were given in eleven different subjects; at the January testing, 3,840 tests, in fifteen different subjects.

It is worthy of note that the Army justifiably believed it possible to construct objectively-scored, short-answer examinations in many subjects the teachers of which theretofore had had little faith in, or experience with, such examinations. The examinations produced stood up very creditably under detailed statistical analysis. The use of this type of test by the Army and Navy in many schools and colleges in the country will unquestionably have far-reaching influence upon the methods of teaching in those schools and colleges hereafter.

On the theory that today's educators must be concerned about the ideas and attitudes of tomorrow's citizens, the Division launched, in the fall of 1942, the Purdue Opinion Poll for Young People. It is a selfsupporting, non-profit enterprise; and this year it has successfully completed its second year of operation. The first poll, in October, 1942, brought responses from 2,898 high-school pupils in Indiana. Poll No. 6, in March, 1944, was ordered for 19,812 pupils in the states of Indiana, Illinois, Ohio, Michigan, and Kentucky, an increase of nearly 700 percent.

On each poll, high-school pupils expressed their opinions on a number of items of importance about which opinion is presumably divergent in the general public. The questions are in the areas of sociology, economics, education, and government; and all proposed items are submitted to an advisory board for criticisms. Those finally chosen are selected on the basis of their pertinence, their implications for learning and teaching, and their place in the hierarchy of values of today's youth.

The poll is not merely a search for opinion: its dominant objective is the discovery of those opinions so that they may be used for constant improvement in the education of high-school pupils.

To the schools participating, a report is sent showing the agreement and disagreement on each item, with breakdowns by grade, home-environment, state, sex, urban-or-rural, and political-preference categories. No attempt, it should be needless to say, is made to indoctrinate, either by items on the poll or by the analysis of the results.

Plans are now in process to utilize WBAA, the University's radio station, to extend the influence of the poll by means of news reports and roundtable discussions of polled issues.

When teachers have a real knowledge of the opinions of their pupils, they should be able to do much more effective teaching. However, should they discover the opinions of pupils about many teaching processes as disclosed by a study made by one of the graduate students, they would undoubtedly be discouraged, and perhaps they might alter their methods.

Planning for the University After the War. The success of the University in adjusting to wartime conditions is proof in itself that the University is aware of the need of foresight for readjustment to post-war conditions. Such planning must fall into two separate categories: the University must try to forecast the future changes in our society and to aid or to counteract those changes in accordance with the soundest educational policies at its command. It must also plan to handle the immediate problems that will face the University as a functioning institution.

The first type of planning can come only as the individuals making up the staffs of the University recognize the changes and readjust to them. Probably no two people anywhere see the future world in the same light, and consequently any expected readjustment will come only as more and more reach concurrence. Such agreement may be hastened by open discussion. In the hope that it will, the Committee on the State of the University has, for several years now, been collecting opinions and fostering discussion on the subject, "What Should Be the Function of the State University in a Modern Democratic Society?" There will never be unanimity, of course; but if the University and the society of which it is a part are democratic, if reasonable discussion can influence free men, then eventual majority agreement may have far-reaching effect on the type of education Purdue University will furnish its students in future years.

The other type of planning leads to more immediate and tangible results. One of the more pressing problems has been turned over for investigation to a new committee, the Committee on Credit for Training and Service in the Armed Forces.

The training programs with which the University itself has been involved have already been evaluated in the terms of standard academic credit. When these programs are in turn standardized by the Service for all training centers and the assignee's record is reported by the institution in complete transcript form, it will not be difficult to determine advanced standing in a curriculum leading to a regular degree. However, many men and women in the services have had valuable training in all sorts of technical fields, and in many cases it is comparable to or surpasses similar training offered in the University. So long as American education measures progress in the terms of hours of class attendance, the problem of correlating such training with languid hours spent under an instructor in a classroom must be faced. Fortunately, the American Council on Education is now sponsoring the preparation of a catalog that will contain evaluations in terms of accepted academic standards of the various training programs administered by the armed forces.

Since the University already investigates requests for advanced standing individually, the Committee has recommended and the faculty has approved the evaluation of such training in the terms of credit. Otherwise, the only specific recommendation made by the Committee is that any man honorably discharged from the armed forces will be exempt from basic military training as required at the University, and any such woman, from the prescribed physical education. Surely these are not unreasonable exemptions. Thus, returning veterans may be assured that they will not be enjoined to register in the R.O.T.C. courses and that they will get fair consideration in any request for advanced standing.

Since Purdue University is but a part of the whole educational system of the state, what happens to Purdue's methods, standards, and objectives depends very largely on what happens to the state. Consequently, whatever the University can do to improve the education in the primary and secondary schools or to aid in adult education throughout the state will ultimately be the influencing factor. In recognition of this fact, the directors of vocational education in the state have formed themselves into a series of committees to study post-war vocational education. They hope to make a series of recommendations that will result in increased vitality in vocational education from grade seven through post-high-school training.

This establishment of collaborating committees upon the recommendation and under the leadership of one of the University's professors of trade and industrial education shows the essential artificiality of separating this report into two sections concerning the University on and beyond the campus. If we may again use the metaphor of a biological organism, the campus in West Lafayette is the nerve center to which come impulses from all over, given impetus by stimuli in the total environment. At the center, these are classified, correlated, and responded to; and from there go reactions and messages that, to some degree at least, help in maintaining the well-being of the entire body politic.

The extent of the University's receptivity to such impulses may be shown by mere statistics. During the fiscal year covered by this report, 52 conferences and short courses of various kinds, listed in full at the end of this report, were held here at the nerve center. Not a month, and scarcely a week, passed without many people coming to the campus to bring new ideas and discuss old, to aid the University in fulfilling what it believes is its true function. Indeed, 11,830 people so came to the campus.

That the subjects discussed covered many segments of contemporary life may be shown by giving the names of a small sampling. In August was held a conference of school superintendents and representatives of industry to discuss the problems of the employment of youth in industry. In September was a meeting of the Post-War Planning Committee of the Indiana Federation of Clubs. In October the Northern Indiana High-School Principals Association met on the campus. In November was a guidance conference attended by those primarily interested in the direction of youth. In December was held the annual conference of Indiana agricultural extension services; in January, the Thirtieth Annual Road School; in February, three short courses on life insurance and a conference on juvenile delinquency; in March, a conference of Indiana florists. In April was held a training school for the War Food Emergency Assistants; in May was a conference on the care of returning veterans, attended by mayors, school superintendents, and selective-service re-employment committeemen; and in June, the twenty-sixth annual 4-H Club Round-up. Surely that random sampling from the 52 such meetings well illustrates the wide usefulness of the University.

How this constant refreshment of campus thought influences educational planning is shown by the following quotations from a report by the Dean of the Schools of Engineering:

> Purdue University must develop its engineering curricula so that its graduates will be competent, not only in the field of engineering design, research, and development, but also in the application of the engineering method to the management and operation of industry. Greater emphasis must be given to sound preparation in the physical sciences and the humanities, and to studies which prepare for good citizenship in a democratic society.
>
> A greater proportion of our more gifted students should be encouraged to prepare for the highly scientific and creative phases of engineering by longer programs of study leading to advanced degrees.
>
> The program of study in aeronautical engineering must be planned so that a larger portion of the graduates from this curriculum are prepared for airplane design, production, and maintenance while providing broader and more fundamental preparation in science and mathematics for those

capable of entering the field of aerodynamics or other highly scientific branches of the airplane industry.

The technical institute type of training should be developed in all industrial centers of Indiana to train through less fundamental, briefer, and more practical types of courses larger numbers of people for subprofessional engineering positions. This type of training will free the engineering college graduate for scientific, creative, and managerial posts in industry.

Purdue University must assume leadership in connection with all types of vocational engineering and supervisory training programs. An enlarged engineering extension program by Purdue University is needed to serve Indiana industry most effectively.

Maximum flexibility in programs and schedules is needed to serve most adequately the returning veterans and displaced war-industry workers, who will be entering Purdue University in large numbers to resume interrupted programs as preparation for civilian pursuits. Refresher courses and special classes will be needed to aid veterans and war workers in adjusting themselves with the least loss of time.

Purdue University can expect increasing numbers of students from other lands, particularly Latin America and China. They will also require special treatment to insure protection to American academic standards while enhancing good will in other countries.

In the development of "graduate study" special attention should be paid to the training of teachers of engineering in order to be of service to the engineering colleges of our country in the post-war faculty rehabilitation problems. The interest in good teaching and in research which has been increasing at a very encouraging rate during recent years will prove helpful to Purdue University in building up its engineering staff to a level well above that of the present.

SPECIAL WARTIME COURSES ON THE CAMPUS

As recounted in the preceding annual report, several special wartime training courses were set up on the campus. Of these, two have been discontinued during the year, as was the Diesel Engine Officers Training School the year before. Some of the remaining have been altered, either in plan or in numbers; others have been continued; and one additional course has been organized. In 1943 the University was notified that it had been selected as one of the universities to offer both the Army Specialized Training Program, known as ASTP, and the Navy College Training Program, known as V-12.

The Army Specialized Training Program. The first contract provided for the housing, messing, and training of 500 advanced engineering trainees. Later, provisions were made for the training of 125 in a personnel psychology course and 750 in the basic course, in addition to the original 500. While these numbers were never fully met, there were on the campus for the twelve-week course, from the first of November to the end of January, 1,324 men in the ASTP, an increase of about 400 over those for the preceding three months. During February and March, 1,189 men were enrolled. Then, on March 31, the ASTP was discontinued, and the soldiers were sent to various camps and posts throughout the United States.

The trainees under this program had been selected from among soldiers at various training centers in the United States. Their quality varied. On the average, they were somewhat superior to the mine-run of civilian students in peacetime, and some of them were definitely highly endowed, particularly those in the course of personnel psychology.

The whole program was probably not too successful. While it offered a number of young men an opportunity to attend a university that they would never otherwise have had, a good many found it hard to readjust to college life, especially while they were under a considerable amount of army discipline. Furthermore, since the term determined upon by the Army was but twelve weeks in length, thus contrasting with the sixteen-week term of the civilian and Navy students, the program required a good many difficult curricular adjustments. This fact also helped to make these soldiers feel that they were not as much a part of the University as would have been desirable.

However, from the broad, national point of view, it was unfortunate that the program could not have been completed as a significant educational experiment. For all the boasting that American education can justifiably indulge in about the freedom of opportunity for higher education, it is nevertheless true that, for various reasons, many thousands of young men and young women do not have such an opportunity. To have carried through a governmental-supported educational scheme giving such opportunity to thousands would have furnished interesting evidence pro and con, and surely the country would have been richer for such a mental investment.

Fortunately, the Army Specialized Training Reserve Program for 17-year-old boys was instituted at Purdue in November, 1943, and is being continued to replace the regular ASTP. However, since the great majority of these youngsters came to the campus after the end of the period covered by this report, nothing can here be said about them, even if it were possible to draw conclusions. These 17-year-olds were among those high-school boys selected by the testing program described in the paragraphs under the heading, "The Division of Educational Reference." As they reach the age of 18, they will be subject to selective service.

The Navy College Training Program. The first term of the Navy College Training Program began on July 5, 1943, with an enrollment of 825 sailors and 425 marines. Since the Navy's term is sixteen weeks in length, the University was able to adjust its program to provide a single calendar for both the civilian and Navy trainees; and the Schools of Engineering adopted the Navy program of study in aeronautical, civil, electrical, and mechanical engineering for civilian students in these fields.

The second term started on November 8, with an enrollment of 901 sailors and 303 marines, of which 114 were classified as being in the first term.

Each term, qualification examinations were given to all second-term basic and engineering trainees to determine which would be continued in the program. Those successful in the test were sent to one of the Engineering Specialist curricula or to the Deck Supply or Engineer curricula. Trainees assigned to Engineering Specialist curricula are allowed to continue in school for a total of eight terms. The programs of study for the other candidates vary in length from four to six terms, and lead to Line Officer commissions. Interestingly, an increasing number of these trainees have seen active duty with the Navy.

This Navy program is being continued for the next year, but radically reduced in numbers, it being reported that about two-thirds only of those who are now here will be allowed to continue.

The Reserve Officers' Training Corps. During the past year the R.O.T.C. has suffered many vicissitudes. In peace years, all physically fit male students of the freshman or sophomore classes have been required to take what is called the basic R.O.T.C. course. The first- and second-year advanced courses were composed of junior and senior volunteers, who wished to continue their training and be commissioned in the Army Reserves. The Corps here at the University had been for some years the largest motorized field artillery unit in the United States and, as reported last year, a very large proportion of field artillery commissions in the Army of the United States were held by Purdue graduates. Naturally, such a Corps would be one of the first parts of the University that would feel the impact of war.

At the close of the summer term in August, 1943, all students enrolled in the second-year advanced course were ordered to their respective officer candidate schools at either Aberdeen, Maryland, or Fort Sill, Oklahoma. During the semi-term, from September to November, 1943, a cadet system was instituted in the basic course, with sophomores acting as cadet officers, and acting satisfactorily. Then, in the first week in October, the first-year advanced course students, who had been sent to the replacement training centers, were ordered back to the University to pursue further training under the ROTC-AST Program until there should be a quota for them at their respective officer candidate schools. Two hundred and three students were returned, and the advanced course was instituted again. The first quotas for officer candidate school were received in December, 1943, and additional quotas continued to be received until March 31, 1944, when all first-year advanced students had been ordered to their respective officer candidate schools.

Upon the departure of the last of the advanced course students in March, field artillery training was discontinued and the basic course in R.O.T.C. became branch immaterial. The cadet system was again instituted, and all field artillery materiel was shipped to various depots.

In May, 1944, the annual Corps inspection was held, and the Corps again received a rating of excellent. At that time, the enrollment in the basic R.O.T.C. course was approximately 320 students.

Inter-American Pilot Training Program. The first direct war service of the University airport was in the training of flight instructors for the Navy. After the demand for instructors was sufficiently reduced, Navy aviation cadets were trained in elementary flight. During the year under report that course was likewise discontinued, and now a number of South

Americans are being trained under the Inter-American Pilot Training Program.

Under this plan young men from various South American countries are selected on a competitive basis from those who volunteer to take the qualifying tests. Three such programs have been organized in the United States, the second and the third here at Purdue. Already thirty-five have been graduated after ten-months training to qualify them to be co-pilots. During their ten months they study the complete range of courses from elementary flight to instruments. Thirty-one are now on the campus.

If these young and charming South Americans carry back to their countries as good an impression of the United States of America as they have brought here of their homes, they will justify the changing of the name to read Inter-American Friendship Training Program.

Cadette Training Program. The year of this report saw the completion of two intensive training programs given by Purdue University to employees of the Curtiss-Wright Corporation and of the Radio Corporation of America. For each group a special ten-month course was developed through the combined efforts of the engineers of each corporation and the appropriate members of the University staff. The young women's weekly schedule included forty hours of recitation, laboratory instruction, and supervised study.

The students, or cadettes as they have come to be called, were chosen by the corporations to fit the specific requirements of jobs to which they were to be assigned and the training program they were to take. In general, they were selected from applicants who had had one or two years of college training, with adequate groundwork in mathematics and physics. The cadettes were enrolled at the University as special students and were housed in the women's residence halls. Each corporation sent a representative of its personnel department as a supervisor who was responsible for activities related to the employing corporation.

The purpose of the Curtiss-Wright curriculum was to prepare the cadettes for employment as engineering aides in the Columbus and Louisville plants. The instruction was directed by the staff of the Mechanical and Aeronautical Engineering School in courses in aerodynamics, wind-tunnel testing, aircraft terminology, mathematics, mechanics, drafting, shop laboratory, and manufacturing materials and processes. Eighty-three girls completed the program on December 4, 1943, and reported to the plants in January.

The plans to start a second program immediately were postponed because of circumstances that arose within the corporation. A second program, however, was started early in July, 1944, but the length of the instructional period was reduced to 24 weeks and the emphasis was placed on developing skill in drafting.

The first program for the Radio Corporation of America was completed in February, 1944, when 73 girls were graduated. They had completed an intensive course in electronics supervised by the School of Electrical Engineering. Subjects taught as supplementary to the major in electricity were mechanics, mathematics, shop, and drafting. The graduates of this course were scattered through the several plants of the Radio Corporation of America, where they are now serving as engineering aides in design drafting and research.

A second RCA course was started in July, 1944, with approximately 70 girls. This course, too, was reduced to 24 weeks and the objective was redefined. The graduates of this second program will act as draftsmen in plants in Indianapolis, Lancaster, Pennsylvania, and Harrison and Camden, New Jersey. The course is being supervised by the General Engineering Department.

Early in the year 47 young women were detailed here under the sponsorship of the Army's Wright Field to take a course of 24 weeks that was similar to the one that was given to the RCA cadettes. In December, 1943, a second group of 53 was sent here from Wright Field. In the main, these young women were very satisfactory students. Despite their lack in basic engineering training, they completed their course successfully and now are rendering valuable service to their employers as technical aides to engineers.

The Naval Training School for Electricians' Mates. In the preceding report mention was made that on June 16, 1942, a unit of the residence halls of the University was commissioned as the U.S.S. *Cary Hall* to serve as barracks for the sailors coming here for an intensive four-months training to fit them to be electricians' mates. That school has been continued, but with some slight modifications toward the end of this period.

Originally, 200 sailors came every month, so that the full complement of the school was 800; and every month approximately 200 were graduated from the course. Recently, however, a change provides that about 100 come to the campus every two weeks and about 100 are graduated at equal intervals.

Since the men taking this course are pursuing a specialized training fitting them for particular ratings, the school is somewhat anomalous. The instruction is under a Director of War Training, who is also the Director of the ESMWT Program and in charge of the Department of General Engineering. With few exceptions, the teachers were specially employed for this purpose and had not previously been members of the University teaching staff. All the sailors have a 44-hour schedule of classes and supervised study and certain other specified duties.

The University has tried to make them feel as much a part of the student body as is possible, and they have all the privileges of the Purdue Memorial Union Building and may partake of the various activities of civilian students. They are, of course, under the command of Navy officers assigned here.

Effect of Special Wartime Services. It is to be hoped that when the war is over a study may be made of the effect upon American universities of the special courses set up during the war years. If the various men and women assigned by the armed forces to campuses throughout the country could be persuaded to express their opinions of American education and American colleges, surely much illuminating material would be available. As those on the campus here at Purdue have seen them, they have reacted in many ways like civilian students; but there are certain differences. They are a little more sure of what they want, probably, and, at the same time, and perhaps therefore, a little more critical of what the University has to offer them. Some of them have been enrolled directly from their college courses. Some have come from training camps after weeks or months of army or navy discipline. And some have seen active service under fire. Such varying groups will have varying reactions; and a breakdown of their opinions according to these categories might show educators some of their weaknesses and some of their strengths.

It is probably fair to say that in a few ways these service men were a disrupting influence on the campus. They formed a group with a different kind of *esprit de corps* than that of the civilian students, and at the beginning of the program there was a tendency for the civilian students to resent them. That soon broke down, however, and in the classes they became accepted. Nevertheless, many teachers found these service men more difficult to handle, a little obstreperous. Although they were under partial Army and Navy discipline on the campus, they found the change from camp discipline perplexing to adjust to. They were young men who were feeling better physically than they had ever felt in their lives, in all probability, and it was hard for them to restrain their high animal spirits while sitting quietly in a classroom. Those who had been in camp or under fire had faced a reality that they found it difficult to square with the seclusion that is inevitable on a college campus. Those who had come directly from college likewise found it hard to adjust themselves to the new discipline of the army control.

The success of the other courses, those taken by the cadettes and by those training to be electricians' mates, has shown the success of more intensive schooling than is customary. These courses, too, will not leave the University untouched.

CIVILIAN STUDENTS ON THE CAMPUS

In normal years, the changes in numbers of civilian students enrolled in the University may be of but little significance save as numbers strain facilities. For the year under report, however, one cannot understand the University without some knowledge of the changes in enrollment. According to the report of the Registrar, which will be found in detail in the Appendix, there was enrolled a total of 5,137 civilian students, a number that excludes duplicates. Of these, 3,518 were men and 1,619 were women. The year before, there had been 6,914 such students, of whom 1,641 were women.

Since the University was kept unusually busy because the actual number of people studying on the campus during the year included so many from the services and in special courses, the most significant fact to be deduced from the figures given for civilian students is the great change in the ratio between men and women. To many, such a change may not seem important. However, Purdue University has been throughout its history definitely a man's college, and the civilian students on the campus this year have been decidedly aware of a changing atmosphere. Not only have many classes been predominantly feminine, but many of the positions usually held by men in student activities have, of necessity, been filled by women and so successfully filled as to threaten male dominance hereafter. In addition, college students are at an age when the opposite sex is of greater importance than at any other period of life. They are particularly sensitive, therefore, to a shift in proportion. Furthermore, women are entering courses which had scarcely ever before enrolled a woman. They are taking courses in engineering, in chemical engineering, in agriculture, and in the sciences that men had thought were their own special fields. All these facts are significant for the University.

The University continued to operate under the calendar decided upon the year before, with three 16-week terms and an eight-week intrasession during the last eight weeks of each. Under this calendar, new students were admitted to the University at six times during the academic year. The number of new civilian undergraduate students admitted was 1,829, a decrease of 46% from the previous year. Almost all the decrease was in men students, 1,236 being admitted as compared with 2,700 in 1942-1943; and 593 women, as compared with 664. Since enrollment as a college student no longer gave a preferential status in regard to military service, the men students who did enter were trying to secure for themselves a stake in an education to which they could return after their discharge from the service. Most of the men were somewhat younger than the pre-war average of college students, and their more noticeable adolescence created some new problems in their adjustment to college life. Indeed, the Dean of Men reports that the morale of the students has been at its lowest ebb during the last three terms.

In addition, the male civilian students on the campus felt themselves definitely outnumbered and perhaps somewhat submerged by the service men. That feeling at the beginning set up a social competition that was not good for morale. It is true that the unrest among the men because of their uncertainty as to draft status disappeared during the year. And,

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since young people tend quickly to accept the status quo as normal, the morale among civilian students was considerably better during the latter half of the year just past than in the year before. Nevertheless, those who remembered the peacetime Purdue were very conscious that they were getting their college education under decidedly abnormal conditions.

Morale. The faculty of a university cannot ignore the state of morale among the students, and in the two years there has been considerable discussion about that problem. During this year, however, most of the faculty feel that the male civilian students still on the campus in certain ways are a select group. Many of them are, of course, listed 4F in the draft, and yet they have felt sufficient urge for an education to resist the lure of high wages and the appeals for patriotic service in wartime industry. Many of the freshmen are selected for a different reason, since the University has admitted a number of especially capable students before they had formally graduated from their high schools. Much the same can be said for the women students. Those who found college work difficult have dropped out and taken jobs, and those who came to college merely because it was the thing to do have probably felt ashamed to continue in that attitude. The total result is that the civilian students have probably done better work in this last year than they have in years past.

In considering the pessimistic report of the Dean, one should remember that a dean of men in any university is likely to base his judgment on his experience with those students who are the abnormal among the group. During war years it is but natural that the tension in the total society should be reflected onto the students. In addition, many of the students were kept in continuing uncertainty about their future, and many others had more money than ever before. Under such circumstances, it is to be expected that adolescent youth will go through a period of what their elders consider an increasing moral laxity. Flagrant cases of that laxity will, of course, come to the attention of the dean; and as younger and more immature students come to the campus directly from high school and even before their graduation therefrom, problems demanding careful counseling will be increased.

Furthermore, in considering this question of morale among the students, there must be taken into consideration the increasing strain among the faculty itself. They have been teaching practically continuously for two years and a half without, for the great majority, more than a five-day interlude. Good teaching is a strenuous exercise, for the good teacher is continuously expending his nerve force. For fifty consecutive minutes in each class he is in constant tension; his mind is steadily active and his attention definitely focussed on his students. Many such teachers have also spent long and wearisome, even though stimulating, hours in the laboratories. One must expect that under such circumstances teachers grow taut, possibly irritable, and less efficient. Students sense those qualities in the teacher and react. Only one who has spent years at a university can judge fairly of the success of Purdue University in maintaining the morale of its students. Certainly the record of college students in this war in all the branches of our armed services and the way they have responded to the accelerated educational program on our campuses refute any charge of weakness in American youth.

Extracurricular Student Activities. Under this discussion of morale, the effect of the limitations forced upon extracurricular student activities must be mentioned. Some of them were discontinued, and others were seriously circumscribed. Two of the most important—the *Exponent*, the student daily paper, and the *Debris*, the student yearbook—suffered from decreased staff and many difficulties in dealing with printers. In both those activities coeds took more prominent parts than ever and have given themselves wholeheartedly to the work. The Scriveners Club, which published the quarterly literary magazine, the *Scrivener*, was suspended until near the end of this period, when the Club was revived under the sponsorship of two members of the English Department. The magazine issued by the students of the School of Agriculture, the Purdue *Agriculturist*, has been shelved for the duration; and the Purdue *Independent*, the paper put out by the independent students on the campus, has not been published for over a year.

Student forensic activities, both intramural and intercollegiate, have been seriously curtailed, all intramural contests and the annual high-school debaters' conference having been suspended. Only the Western Conference Debate League program survived, but the number of events for that was cut from four to two. The loss of the entire dramatic staff to the armed services, the shortage of student help for backstage work, and the almost total lack of men for play casts seriously disrupted the dramatics program. Nevertheless, Purdue Playshop surmounted these obstacles and presented five full-length plays during the 1943-1944 school year—*Hayfever, The Pursuit of Happiness, My Sister Eileen, A Philadelphia Story,* and *Ladies in Retirement.* One performance of each of these plays was reserved for the Army and Navy trainees stationed at Purdue.

All such limitations on the opportunity for out-of-classroom activity deprive the students of many ways of using their leisure time creatively. If the values usually attributed to participation in extracurricular work are really obtained, then the students during these war years have suffered seriously. Students cannot spend all their hours in the classroom or the laboratory or over their desks preparing for the next day's assignments; they need places to go and things to do. It is to be hoped that these activities will be revived as soon as it is possible. With the coming to the campus of returned veterans, the need for such activities will be heightened. Many of those veterans may be suffering from the psychological strains of their experiences. Unless they have some opportunity to lose themselves in worthwhile group activities or in some method of self-expression, many of them will become turned in upon themselves, will brood over their past experiences, and make their readjustment to civilian life increasingly difficult.

The University is forming plans for counseling and advice for these veterans. It must also arrange for some sort of therapy. Some of these men will profit most from going into various group activities—intramural and intercollegiate athletics, debating, dramatics. Opportunities for them to get out with crowds of young people of approximately their own age, on picnics, at dances, and in various social gatherings, will be of great importance. Others will need the opportunity to find themselves in quiet and creative ways. Some of the facilities of the Purdue Memorial Union Building will be of more importance than ever before—the Music Room, where a troubled veteran may sit and find calm while listening to the harmonies of great composers; the Browsing Room, where he can soak himself in the stream of our culture and of those of other nations—these, for many, will be the best sort of therapy.

Others will need some more active but individual work. For them the Puttering Room, where they can paint and model in clay and make with their hands and their brains whatever they need to express themselves, will be essential. The aid of a skilled and sympathetic artist to help them in the problems of technique should do much for many of these men. He should not, of course, think of himself as skilled in occupational therapy, for these men will flare off from that sort of thing: they will not want treatment, but opportunity. When they find themselves creating beauty in a world they thought submerged in ugliness, their scars will heal. From the skills of destruction they must learn to turn to the skills of creation.

Neither the students nor the University has been unaware of these needs. The students have voluntarily engaged in certain wartime activities that have served as partial substitutes, and the University has sponsored many entertainments to furnish some sort of relaxation. A number of coeds have been active in the Red Cross, and the Student War Council was active in the collection of about $1,185 for the Red Cross and in the collecting, cleaning, and shipping of nearly 2,000 books for Allied prisoners of war. In this second activity, the Council enlisted the aid of other campus organizations. The books were collected from students by members of the Gimlet and Reamer Clubs; the cleaning of the books was directed by the Activities Bureau; and the money necessary to ship them to New York was given by the Women's Residence Halls.

The faculty representatives to the Big Ten Conference recognized this need on their various campuses. They adopted, therefore, a resolution abrogating all eligibility rules for participation in athletics for the duration of the war, leaving as the only condition that participants must be regularly enrolled students.

The Spanish staff of the Department of Modern Languages organized a Spanish-American Club, which has held meetings at various times throughout the year. The Club is composed of members of the Purdue staff, American students, Latin-American students, Inter-American flyers, and others interested in the study of Spanish and of Spanish-American civilization. The Club tries to provide opportunity for Americans to make the acquaintance of the Spanish-speaking peoples and to promote goodneighborliness by social contacts between these groups. Any such opportunity for friendly relations is an excellent tonic for morale.

University-Sponsored Entertainment. During the year the Committee on Convocations and Public Lectures of the University arranged for fourteen lectures, concerts, or plays, as shown in the list below.

The production of the now-famous play, *Life with Father,* was a new and highly successful departure. It is much to be hoped that the University will be able to bring to the campus many more such worthwhile functions, for a serious lack among modern college students is their ignorance of the drama. Brought up on the movies only, they know practically nothing of the legitimate stage.

The Committee also sponsored three showings of the Black Hills Passion Play on December 2 and 3, 1943, which excited a great deal of favorable comment. In addition to the scheduled convocations, certain special events were supported by the convocation funds: August 25, 1943, the Bali-Java Dancers; January 29, 1944, the Purdue Musical Organizations, with Benno Rabinoff, violinist; and in March, April, and May, 1944, "Screen Reviews," including a special showing of *Fantasia,* on March 10. All in all, the year was pretty well filled with opportunities for entertainment and enlightenment.

The following convocations and lectures were presented during 1943-1944:

September 11, 1943—Richard Crooks, tenor, with William Primrose, violist
October 15, 1943—Paul Draper and Larry Adler
November 6, 1943—Harold Bauer and Eugenia Honeywell, duo-pianists
November 14, 1943—Earle Spicer, baritone
December 9, 1943—The Ballet Theatre
January 16, 1944—Columbia All-Star Quartet—Tuminia, Olheim, Gorin, Martini
March 9, 1944—"Life With Father"
March 17, 1944—Indianapolis Symphony Orchestra
March 30, 1944—Julian Bryan, lectures with films
April 9, 1944—Apollo Boys Choir of Dallas, Texas
April 21, 1944—Percy Grainger, composer-pianist
May 6, 1944—Dr. Franz J. Polgar: "Miracles of the Mind"
May 27, 1944—Vivian Della Chiesa, soprano
June 18, 1944—Charles Kullman, tenor

Besides this regular convocation series, other entertainments, called "Victory Varieties," were presented during the year. Though primarily for service men, tickets were sold to students and townspeople. The "Victory Varieties" brought to the campus different musical and vaudeville acts on eleven different evenings. They were a more definitely amusing and relaxing program than was the convocation series.

Religious Convocations. Through necessity, the number of religious convocations which have been arranged for by the University for several years was limited. The Purdue University Choir and Orchestra gave beautiful programs of Christmas and Easter music. The observance of Memorial Day took the form of a religious convocation on Sunday, May 28, with music provided by the University Glee Club. Chaplain James E. Reeves of the Great Lakes Naval Training School was the guest speaker. With the unhappily increasing list of Purdue dead, this ceremony was impressive.

Graduations. The new academic calendar providing six times at which new students can enroll in the University correspondingly allowed for six times at which students could graduate, in August, October, January, February, April, and June. At these six times, 925 men and women received bachelor's degrees and 120, post-graduate degrees. Of these latter, 45 were the degree of Doctor of Philosophy. An examination of the table in the Appendix will show some significant changes in student enrollment. It will be seen that in August, 1943, 488 people received degrees. They, of course, were those who had received a large part of their college work either before the declaration of war or during the twenty months thereafter. The irregularity brought about by the new calendar is illustrated by the figures for the other times of graduation. In October, 53 were graduated; in January, 95; in February, 147; in April, 41; and finally in June, 223.

The reactions of the students in regard to these irregular periods of graduation gives insight into how they feel about the abnormality of their period of formal education. When so few as 41 are receiving their degrees, it would seem unnecessary to have any particular ceremony, especially as a number of students graduating at these times had already left to take up work, so that actually their degrees were conferred in absentia. Nevertheless, the students showed great anxiety to have some sort of ceremony. They, of course, cherish their diplomas and feel that their value is enhanced if they are formally presented. Consequently, the University arranged for some sort of graduation ceremony at each of these times.

At the exercises held on February 27, 1944, five distinguished men were given the degree of Doctor of Engineering: John Walter Dietz, Channing Rice Dooley, John Walter Esterline, Robert McFarland Gates, and Russell Randolph Waesche. On June 25, three were given honorary degrees: George Irving Christie, Doctor of Laws; Blake Ragsdale Van Leer, Doctor of Engineering; and Chester Hamlin Werkman, Doctor of Science.

Graduate Study. As was to be expected, the enrollment of graduate students has dropped radically since 1939. During the academic year of 1939-1940, 832 graduate students were registered in the University. Since that time, the enrollment has declined until only 484 were registered during this last year. The greatest reduction was among those studying agriculture; only a small decrease occurred in the engineering schools; and there was a small increase in the number of graduate students in both chemistry and physics. In education and applied psychology likewise a slightly larger number was registered.

The figures of enrollment of graduate students scarcely reflect the true situation, since many of these students in 1943-44 were employed full-time and therefore could give but a very limited amount of time to their graduate study. Many of them have been working on important secret research under the guidance of their professors; and when the final story can be told, they will be seen to have contributed a great deal. Nevertheless, there was much confusion, for many of them were subject to the draft and their research was constantly being interrupted. In most cases it was possible to obtain deferment for them on the grounds that they were making a genuine contribution to the war effort; but the confusion and uncertainty that beset them was sometimes a serious handicap.

The Graduate School expects a very great increase in enrollment after the war, and many departments are planning to place increased emphasis on their graduate programs. With this in mind, during the year the graduate work in the various departments of the University has been reviewed and analyzed by the Graduate Council.

For at least two reasons this expectation of increased enrollment will, in all probability, be fulfilled. More and more, of course, it has become apparent throughout the country that a bachelor's degree no longer represents the culmination of education. It is not an open sesame to success in the workaday world. During these years of war, industry has recognized more plainly than ever before the value of scientific research, and it will, therefore, demand more and more men capable of doing that research. Consequently, many students, who before would have sought positions on the basis of their bachelor's degree, will feel the need for advanced study. In the second place, many returning veterans will realize that a year or two of graduate study will tide them over the period of economic uncertainty that is almost bound to follow the war and at the same time allow them more easily to readjust to civilian life. Purdue will be prepared to take care of both these groups.

The University Beyond the Campus

SEVENTY-FIVE YEARS from now, some aspiring candidate for the degree of Doctor of Philosophy will write a history of twentieth-century education in these United States. What, at that far distant time, he will call good and what bad, we cannot tell. Both the subject matter and the method of education are now under the fire of criticism, much of it justified and much unfair. If America and the American democratic way of life survive during the next half century, then in retrospect education in America will have justified itself. If our democracy fails, then American education will get much of the blame, whether it deserves it or not.

One thing our hypothetical Ph.D. is almost sure to approve, however, is the effort of American colleges and universities to extend their services beyond the bounds of the campus. The long history of what we call higher education shows a complete reversal in purpose and in function. For many centuries the universities were conservatories of knowledge. So long as man walked backward through the world, gazing with eyes of admiration on what he called antiquity, the purpose of a center of learning was to exhume and preserve already discovered knowledge. Then, at the beginning of the seventeenth century, man slowly turned around. Stimulated primarily by Francis Bacon, he began to look to the future and to believe that one of his chief tasks was the discovery of new knowledge. For nearly two centuries the universities lagged behind, so that it was not until the last half of the nineteenth century that they realized that one of their chief functions should be the production of knowledge.

In America, the Land-Grant Act of 1862 is an important signpost of the new direction. That Act provided for grants of land to the various states for the "endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislature of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." Those words were vastly significant for America: the universities were no longer to be cloistered conservatories of learning; and, since agricultural and mechanic arts were still so largely undiscovered, the last phrase put emphasis on the production of knowledge. The growth of this newer point of view was recognized and stimulated when, in 1887, the Federal Congress passed the so-called Hatch Act for the establishment of agricultural experiment stations.

This recognition of a new responsibility inevitably required the acceptance of another obligation. Man was unearthing nature's secrets and devising new methods of utilization at an accelerating pace. No longer could graduation from high school or college be considered the culmination of education. More and more people realized that success, no matter on what scale it was to be measured, depended on receptivity to new knowledge. To promote the liberal and practical education of the industrial classes in the several pursuits and professions in life, the universities would have to educate the populace long after they had passed their school years. Again the change was recognized by the Federal Congress, which, in 1914, passed the Smith-Lever Act providing for agricultural extension work.

Since then, of course, the universities in America have extended their services in many directions. In addition to agricultural extension work, which, of course, centers in certain universities only, the colleges have offered correspondence courses in the liberal arts, in science, and in the professions and technologies. These correspondence and extension courses have had no little influence on the increase in numbers of men and women who have attended the college campuses themselves. They have proved that knowledge begets the desire for knowledge.

Until this war the Federal Government had not subsidized much research in other than the agricultural arts as an adjunct to American education. That this was in some ways unfortunate, the present war has shown. Industry and the universities had at their own expense and on their own initiative done much of the research that has given this country its military dominance. Especially was this true in chemistry and in the various technologies of engineering. Only the blindest could fail to see that competence in those fields would find immediate reward.

In the more abstract field of physics, however, there was a shortage. Few high-school graduates were found clamoring for instruction in spectroscopy or nuclear physics, for instance. Consequently, university physicists have been forced to carry such a burden of research that the training of new physicists has suffered.

The recognition of the value of scientific and technological research by the populace and by the government is bound to result in a demand that our universities do more of it. Industry for many years has supported and encouraged industrial research, but such research is expensive and only the larger industries can afford it. Even now it has been suggested that the Federal Government establish laboratories to which smaller industries can go for the solution of research problems. And some of the activities of the National Research Council and the National Defense Research Committee will unquestionably survive the war.

For many years Purdue University has been sensitive to this trend in education. It has, of course, been active in agricultural extension and agricultural research from the very beginning. In 1919 it established an engineering experiment station, and shortly thereafter a department of engineering extension. In 1928 there was established as an adjunct to the University the Purdue Research Foundation, which stimulated and supported many kinds of original and fundamental research. And during the year under report the University has set up a Division of Technical Institutes to aid in the education of those who cannot come to the University for a technical education.

This section of the annual report of the University will describe the University's off-campus services. It will show that they are far-reaching and multifarious and that the University has been eager to fulfill every demand made upon it that it can, within the limits of its resources. But, more than that: it tries to create a demand where it sees there should be one.

THE UNIVERSITY'S AID TO WARTIME AGRICULTURE

The Agricultural Experiment Station. Chronologically, the Agricultural Experiment Station comes first. And, as it is the source from which information is spread by the extension department, it should lead in this description. Besides the experimental plots and farms immediately around the campus, the Station operates six large demonstration and experimental farms and six experimental fields in different parts of the state. The approximate locations of these experimental centers and their chief operation are illustrated on the map on the inside of the cover. These farms have been given at various times by public-spirited people who have recognized the need for increased agricultural research. Some industries spend as much as 1% of their gross income for research. One percent of Indiana's farm income for 1943 would amount to more than six million dollars; yet actually, less than one tenth of one percent of that income is spent for agricultural research. Such figures show how important has been the contribution of these donors of experimental farms.

Fully to tell the story of Purdue's aid to wartime agriculture would require an account of all the Experiment Station's researches since its beginning. Had not the agricultural experiment stations throughout the country been investigating for now nearly sixty years the means of producing ever-greater quantities of food, of developing new and sounder strains of crops, of combatting insect and other pests, of conducting a farm in more practical and economic ways, American agriculture could not so magnificently have met the test of these wartime years.

But this report is an annual report. It must confine itself to some account of experiments now being carried on. Yet, since agricultural experimentation is not a matter of a few months, but sometimes of many years, the reader must not expect accounts of final discoveries. Many of the experiments recounted in the report for 1942-43 are being continued. This report will confine itself to a short description of some of the investigations being carried on at the various experimental farms.

The Miller-Purdue Memorial Farm. In 1938 Mr. I. M. Miller deeded to the University his farm near Upland, Indiana. Since Mr. Miller was one of the pioneer livestock farmers of the state, it was felt that the finest contribution this farm could make to agriculture would be a research program investigating permanent rotation and supplemental pastures and pasture improvement. The farm consists of 700 acres of land in bluegrass and woods on the representative soil types of east central Indiana.

During the past five years the possibility of improving permanent bluegrass pastures has been studied. Seven ten-acre paddocks are being used to measure the effects of fertilizing, liming, mowing, delayed spring and fall grazing, and the effect of rotating cattle on the pasture at two-week intervals. Some of the best treatment has so improved these pastures that now one and one-fourth acres can carry a steer throughout the entire pasture season. Furthermore, gains of as much as two and two-thirds pounds per head per day have been made on these pastures. Most cattle feeders would be pleased with such gains in the dry lot, with expensive grains and concentrated feeds. In addition to the bluegrass studies, seedings have been made in eighteen four-acre paddocks in order to compare mixtures of alfalfa and timothy, alfalfa and brome grass, Ladino clover and brome grass, and Birdsfoot trefoil and bluegrass—all new mixtures of grasses and legumes likely to be used extensively in rotation pastures throughout the state. Sudan grass has also been tested as a supplemental pasture for bluegrass during the dry season in the summer.

Feeding trials have been made with steers on pasture. The relative rate and cost of gain when steers were fed during the entire six-months grazing period were compared to those of steers fed only during the last three months of the same period, Another group of steers was grazed for the entire six months and then fed for three months at the conclusion of the grazing season. The results of these investigations are especially important during these times when it is essential to save grain for our war food production program.

About a hundred acres of woods on the farm have been set aside for a project in woods management in co-operation with the Forestry Department. Experimental plantings of Asiatic chestnut trees have been made to determine the adaptability of six new species under the conditions of this locality.

But the farm has done more than lead to experimental results made available to the farmers of the state. During the past year more than 80,000 pounds of live weight of beef were produced on the farm and several thousand feet of lumber were harvested from the woods.

Edmund Throckmorton Farm Memorial. This farm of 300 acres, a bequest of Dr. George K. Throckmorton in 1935, is being used for a study of the effect of various land uses and soil treatments on water run-off, soil erosion, the losses of plant food and the different soil constituents. Sixteen watersheds have been surveyed and dykes built so as to cause the surface run-off to flow through flumes which have been installed and equipped with automatic run-off measuring devices. After a two-year calibration period under a uniform crop existence, these watersheds were divided into two groups. Half of them are being farmed according to the prevailing practices in the community and the other half according to an improved-practice plan, which calls for corn to be planted and cultivated on the contour. The moisture saved for the crop amounted to 18% of the rainfall available to the crop on the check-rowed areas. Determinations made in August showed that 50% more moisture is available in the upper fourteen inches of soil in the contoured corn than in the check-rowed corn.

Corn and wheat have also been grown with different applications and methods of mulching. Manure has also been used as a method of increasing the organic matter in the soil. Last year fifty head of two-year-old steers were fattened on the farm to provide manure for these investigations. Incidentally, they added about 15,000 pounds of liveweight beef to the amounts available for civilian and military uses. On fifteen acres Fairfield wheat, the new smut-, rust-, and cold-resistant variety of soft winter wheat developed by the Experiment Station, was multiplied and distributed among farmers of the neighborhood.

A report of the hydrologic studies being conducted on the farm in co-operation with the Soil Conservation Department and the Departments of Agronomy and Agricultural Engineering points out that no longer is it fair to say that everybody talks about the weather but no one does anything about it.

The Lynnwood Farm. In 1942 Mr. and Mrs. Charles J. Lynn of Indianapolis gave to Purdue University their farm of 623 acres of fertile land four miles east of Carmel, Indiana. On the farm were excellent herds of Percheron horses, Polled Shorthorn cattle, and Berkshire hogs. Consequently, the farm is being used for breeding and experimental livestock purposes.

The Percherons are headed by Don Again, 207737, "premier sire of the breed." His son, the famous show stallion, Lynnwood Don, 231169, is also used in the herd. At the present time the herd of sixty head includes some of the most notable show and brood mares in the breed, and fourteen excellent foals were raised during the past season. From this farm, breeding stock of the very highest quality is made available to the farmers of the state.

In founding his Polled Shorthorn breeding herd, Mr. Lynn spared no expense to get some of the best individuals and blood lines of the breed. The herd now consists of about 175 head and includes such noted bulls as Fascinator, X2016414, Collynie Spotlight, X1888461, and Lynnwood Spotlight, X2001004. Breeding stock from this herd during the year went into twelve different states, but more than half of the 31 bulls and 47 cows and heifers sold stayed in Indiana to improve the herds in which they are to be used. In addition, 19 animals were sold for beef.

Lynnwood Berkshires have consistently stood at the top in the leading shows and have made a notable record in the herd-classification programs sponsored by the record association. Because of their high quality a large percentage of the 500 animals in the herd were sold for breeding purposes and are being used in herds of Berkshires all over the United States. During the year 162 boars and 195 sows and gilts were sold for breeding purposes, and 247 hogs were sold on the market.

The Pinney-Purdue Farm. The University received this farm in 1919 through the generosity of Mr. William E. Pinney of Valparaiso, Indiana, and his daughter, Mrs. Ainsworth W. Clark. The farm consists of three distinct types of soil—clay loam, muck, and sandy loam—thus providing opportunity for corn-performance and other types of tests on all three types of soils common to the region. Corn-breeding tests and variety tests of soybeans are being carried on, and certified soybeans and hybrid seed corn, as well as seed oats and seed wheat, are being grown on the farm and distributed to farmers in this section of the state. Thus these farmers have the very latest and most improved varieties of grain, such as Fairfield wheat and Earlyana soybeans, a large acreage of each of which was produced and distributed to farmers during the past season.

A herd of Red Poll cattle is being maintained on the farm, and records of the growth and individuality of the calves are kept. A breeding and testing program for the improvement of these animals is being developed. In 1941 a swine-breeding program was initiated in co-operation with the regional Swine Breeding Laboratory of the U. S. Department of Agriculture. Its goal is the development of more efficient hogs that will yield a lower percentage of lard than most existing breeds. In this effort a Landrace-Duroc boar has been mated with Duroc Jersey sows. Some of the same methods that have proved successful in the development of hybrid corn are used in the development of this strain of hybrid hogs. The selections are made on the basis of rapidity of gain, fertility, nursing ability, general vitality, and carcase quality; and moderate inbreeding is used to establish uniformity.

The Herbert Davis Forestry Farm. On the eastern side of the state near Farmland is the Herbert Davis Forestry Farm, a bequest made by Mrs. Martha F. Davis to the University as a memorial to her son, Herbert Davis. A part of the 120 acres of woodland on the farm is virgin timber and is being maintained in its original state for the benefit of posterity. The woods have been carefully cataloged and descriptions of trees have been made so that the changes in growth can be accurately measured. Wildlife is protected and fed during the winter in accordance with the wishes of Mrs. Davis.

A herd of about fifty Polled Milking Shorthorn cattle is used in a breeding program that has for its aim the improvement of the herd in such factors as fertility, form, and quality of carcase, while maintaining a milk production of about 7,000 pounds of milk annually from mature cows. The steer calves produced on this farm sold at nearly the top of the market for the day they were sold at the Indianapolis stockyards. A breeding program was begun in 1941 for the improvement of Chester White swine in co-operation with the regional swine breeding laboratory.

A new strain of fly-resistant wheat is being tested in co-operation with the Botany Department. Several improved varieties of seed oats and soybeans are being distributed to farmers in the area, and the Lincoln soybean seed produced during the past season will be used by certified seed growers throughout the east central part of the state in 1945. Preliminary trials indicate that this bean will be as much of an improvement over the old varieties as hybrid corn has been over open-pollinated corn.

The Moses Fell Annex Farm. This farm, near Bedford, is the oldest of the outlying experimental farms, having been given to Purdue University in 1914, with supplementary funds for its development and maintenance so that the farmers and fruit growers of southern Indiana might receive the benefits of research work. Twenty-six years of results are now available from the fertilizer trials and various soil treatments that have been carried on during this period.

The increases in crop yields due to the use of lime and fertilizer have given a return of $4.40 on each dollar expended on these materials. These results have formed the basis for a permanent agricultural program for that section of Indiana. Variety tests of all types of crops and seed production of wheat and winter oats are part of the crop-improvement program on the farm. Variety tests of hybrid corn have also been carried on for a number of years.

Since horticulture is of great importance in that section of the state, an orchard of more than sixty acres is maintained in which are grown the leading varieties of apples, pears, and plums. Various methods of management, including fertilizing, mulching, spray application, harvesting, and marketing, have claimed the attention of the horticultural staff of the Station and formed a basis for many recommendations. More than 6,000 bushels of apples were produced in the orchard last year, and a very large proportion of them went directly to the Army and the Navy.

For fifteen years complete records have been kept on the stationary spray plant operations. The spray material applied with this equipment has been put on for 43 cents per hundred gallons, which compares to the 70 cents per hundred gallons applied with portable spray equipment.

To meet the active August market demand, eight acres of various apple varieties ripening at that season of the year are being tested. In 1943, forty-five Maiden Blush trees grew 646 bushels of fruit, which sold for $1,421.05.

On the farm is maintained a flock of pure-bred Shropshire sheep, from which pure-bred lambs are sold in the area. A flock of 35 western ewes is also kept to demonstrate the crossing of these ewes with the Southdown lamb for the production of market lambs.

Furthermore, a herd of more than 40 Milking Shorthorn cattle is being maintained for a breeding program for the development of these dual-purpose cattle.

What Experimental Fields and Plots Do for Agriculture. Hybrid corn is one of the greatest developments in agricultural research during the century. This research, it has been estimated, was directly responsible for an increase of thirty million bushels of corn in Indiana in 1943. In carrying forward this program, tests are made of all new strains in twelve to fifteen places in the state. From these tests it is possible to choose a variety best adapted for a specific region.

In the last few years, five new varieties of soybeans have been released and are adding largely to farm income in the state. Gibson and Patoka, two new yellow-seeded varieties, are especially adapted to southwestern Indiana. Before their development, black-seeded varieties, which produced an oil of poor color and were consequently discounted by processors, were grown largely in the area. It is estimated that farmers of this region now get 20 cents more per bushel for the new varieties than for those formerly grown. The new Lincoln variety adopted for central Indiana has outyielded older varieties by from 20 to 25% in the experimental plots. The Richland bean developed at Purdue is the most widely used variety of its growth period in the United States.

Fairfield wheat and Clinton, Tama, and Vicland oats are new varieties much superior to those formerly grown in such characteristics as yield and disease and lodging resistance. In their development, experimental fields and test plots have been used extensively. For many years, fertilizer tests have been in progress at the experimental fields. As an example of the benefits from these studies, the recommended treatment of lime, manure, phosphorus, and potash developed at the North Vernon Field has given returns of sixteen dollars at a cost of four dollars at pre-war prices for crops. As a result, fertility and rotation practices have been adopted widely and have increased yields, reduced unit costs, and conserved the soil. More recent experiments have shown how to utilize nitrogen effectively in the fertilization of corn. From these experiments corn yields have increased from 20 to 40 bushels, and this benefit is in addition to the residual benefits to succeeding crops.

The muck soils of northern Indiana constitute one of the few remaining undeveloped resources of the state. Experiments at the Muck Farm are now obtaining facts that will show farmers how best to utilize and manage these soils for increased yields and conservation of the soils, which are subject to bad blowing and to loss through oxidation. It is estimated that improved practices in growing and handling mint, which have resulted largely from experiments conducted at this farm, are netting mint growers of northern Indiana an increased income of $400,000 annually. Similarly, experiments at the Sand Farm at Johnson are resulting in greatly improved practices for vegetable growers, and a new disease-resistant variety of muskmelon developed on this farm was released in 1944.

The Department of Agricultural Extension. The magnificent achievement of American agriculture in meeting our wartime demands for more and more food and other agricultural products has been due primarily, of course, to the willingness of American farmers to put in long, hard hours of patriotic work under unusual handicaps. But without a knowledge of what agricultural scientists have accomplished, even the hardest work could not have brought such great results. It is the function of the extension worker to furnish that knowledge directly to the farmer, where it can be applied for immediate practical accomplishment.

Here in Indiana 92 county agricultural agents, 55 home demonstration agents, 15 assistant county agents, and 60 extension specialists have done their job faithfully and enthusiastically. During the past year, for instance, these workers held 32,058 meetings, attended by 1,313,757 people. According to the reports for the year ending December 1, 1943, made by the county agricultural agents, 134,047 families of the 184,549 farms in the state were influenced by some phase of the extension program. Figures from the reports of these county agents are impressive: on 119,104 farms the extension program brought about definite changes in practices, and of these 22,218 were reached by the agents for the first time in that year. In addition, 74,217 families not living on farms made changes in practices as a result of the agricultural program. In addition, the home demonstration agents have brought about changes in household practices in 55,455 farms, of which 13,274 were reached for the first time. As a result of the same program, 40,137 homes not on farms adopted practices as a result of the home demonstration program, 24,914 of these having been reached for the first time. There are in the state 30,415 farm homes with members enrolled in the 4-H Clubs, and 12,734 other homes with such members. In summary, 134,047 different farm families were influenced by some phase of the extension program, and 88,583 other families.

Those figures are sufficiently impressive to make it appear as if no other effort were still needed. Yet, since February 1, 1944, fifty-eight emergency war food assistants have been employed from funds provided by the War Food Administration.

The agricultural extension program does not merely help farm people: it persuades thousands to serve as leaders in their own communities. That rural leadership has responded magnificently to the wartime need. During the year thousands of men and women served as leaders in the various counties of the state; indeed, 55,575 positions of leadership were filled by them, a number that compares with 25,766 in 1941. That increase of 29,809 means an average of 324 more in each county. These volunteer leaders held 30,028 educational meetings which were not participated in by paid extension workers, meetings that were attended by a total of 518,379 adults and 210,241 4-H and older youth. These activities included educational work in agriculture and home economics, as well as scrap, bond, and Red Cross drives. Obviously, Indiana agriculture has done its part and more.

Under the direction of county extension committees consisting of representatives of every agricultural interest, programs have been developed in every county to solve the problems of farmers and homemakers. More specialized committees have given direct support to the activities undertaken. On the average, 505 leaders per county have supported the informational program, which resulted in applying the facts of the Experiment Station to the farm and home problems of rural people throughout the state.

These statistical summaries from the 92 counties all reflect increased co-operation by rural leaders—increased office telephone calls, more news stories, more bulletins distributed, and more meetings.

The problem of meeting a critical feed and livestock situation has been one of the most acute for Indiana farmers. It has been attacked by the agricultural extension service by disseminating outlook information, which showed the oversupply of livestock and the insufficient feed supply to maintain it. The Department of Agricultural Economics showed the situation; the Agronomy Department gave the information on fertilizers, varieties of grain crops to plant for high yields, the methods of managing pastures to relieve grain shortages; and the Animal Husbandry, the Dairy, and the Poultry Departments showed how to economize feed supplies to get maximum results from the feed fed. Particular emphasis was given to the culling out of inferior livestock, the creation of satisfactory housing conditions, proper sanitation, and the control of diseases. In almost every conceivable way, the county extension agents, working through county committees, gave the information to farmers.

Thirty-two Purdue extension specialists gave instruction at 29 different kinds of extension schools and special meetings, to a total of 509 such schools. The instruction included information on farm management, crops, dairy husbandry, hogs, corn borer control, farm machinery, forestry, poultry, livestock diseases, general insects, gardens, soil conservation, and tomatoes. These meetings were attended by 28,480 adults and 4,522 high-school boys.

In the 28 large grazing counties of the state, sheep shearing schools were held by the Animal Husbandry Extension Department, with a total attendance of 578. These schools helped to solve the acute shortage of sheep shearers, since about 200 people learned how to operate power clippers this year and about 100 were trained during the preceding two years. Thus, 300 men and boys could not only shear their own sheep but other flocks in their neighborhoods as well.

As another wartime activity, the Animal Husbandry Department has encouraged the production of shearling pelts for aviator uniforms. By shearing yearling feeders and feeder lambs at the proper time, the Indiana sheep industry has furnished 225,000 number one pelts for aviator uniforms.

Victory gardens have, of course, been of major importance this year as well as in the past two years. For 1944 the goal is set at 500,000. Eighty-one winter and early spring leader-training meetings in 58 counties had an attendance of 3,472 adults. Most of those attending were leaders learning to carry garden information to other gardeners, many thousands of them. Garden leaflets and bulletins to the staggering total of 390,500 have been made available for distribution in the 92 counties.

Tomatoes, an important product in the Indiana all-out food production program, were the subject discussed at 65 meetings in 41 counties by the horticultural specialist.

The farm labor situation in the state has been critical. There is a definite shortage of year-round workers in all sections. During the year ending June 30, 1944, the period of this report, 45,636 seasonal and 2,965 year-round farm labor placements were made by the county agricultural agents. In April, 1943, the responsibility for training and placing farm labor was assigned specifically to the agricultural extension service by a federal law. Obviously, the service has met that obligation. It is interesting to note that except for 3,620 prisoners of war, 421 foreign workers, and 1,648 out-of-state workers, all placements were filled by local recruiting.

One particularly notable solution of a critical labor problem was the recruitment, supervision, and housing of 1,023 young men in six different camps for periods of two or three weeks for the detasseling of hybrid corn, a necessary step in the production of seed corn. Twenty-three supervisors were employed in the six camps operated.

While the agricultural extension program was stressing the production of more food, the home economics program has put emphasis on the preservation of food. More food was canned, dehydrated, and stored in Indiana in 1943 than in any previous year, and increased emphasis is being placed on the projects for 1944. Through funds provided by the War Food Administration, 31 women are working in counties without home demonstration agents, and in the larger counties with agents. During the quarter ending on June 30, these agents held 715 food preservation meetings with an attendance of 16,605 people. In addition, home demonstration agents in 57 counties held 580 demonstrations attended by 11,308 people.

These paragraphs give but a short and rough summary of the work of the Department of Agricultural Extension. They merely cite examples of war-induced activities of extension workers, who have been giving themselves wholeheartedly in helping farm folk to do more and more with less, to produce bumper crops while most of the younger farmers are gone from the farm, and to get crops planted and harvested with little new machinery. Their success has been achieved with the co-operation of other governmental agencies, farm and civic organizations, business interests, and the press.

The state newspapers and radio stations have been utilized as fully as possible for getting to the farmers the information that could help them; and the extension service gratefully recognizes their wholehearted co-operation. What this has meant is shown by a brief summary of some of the major activities of the Office of Extension Information. During the past year that office distributed 816 news stories for publication by newspapers and magazines. It produced 138 radio transcriptions, which were distributed to 25 different radio stations serving Indiana. Over Purdue's own radio station, WBAA, 258 farm programs of 30 minutes' length were presented, and a like number of home economics programs. Furthermore, 204 two-page radio scripts were distributed among Indiana radio stations, and more than 8,100 newspaper mats on several hundred topics were released to the county agricultural and home demonstration agents and newspapers. Yet even these figures do not tell the full story, for they do not include the hundreds of news stories written by county extension workers for local newspapers nor the many appearances of such workers on local radio stations, of which 16 have regular farm programs, some presented daily.

Farmers' Institutes. The initial form of agricultural extension work was the holding of farmers' institutes. And in this, the fifty-fourth year, such institutes were held in 188 communities during the winter of 1943-44. These meetings were attended by a total of 34,345 people, an average attendance of 183, of whom 98 were adults and 85 youth. But such figures are cold and meaningless and give but little understanding of the value of these institutes to American rural life. When one learns, however, that 2,630 men and women served as officers or as members of committees, one realizes the valuable training in rural and community leadership such a program furnishes. Since the farmers' institute staff of the University consists of 19 men and 11 women, much of the work and the organization of the institute programs is done by the local leaders.

The programs arranged emphasized the inspirational and informational phases of family life, community co-operation, the rural churches, 4-H Club work, vocational guidance, the value of recreation, the maintenance of sound health, and many other such subjects for the promotion of community well-being. Local and guest speakers give talks; entertainment is furnished by local talent; and exhibits of farm and home products are arranged. Products made by 3,742 exhibitors were shown in adult classes, and 4,101 in junior classes.

4-H Club Work. The work of the 4-H clubs is with real problems on the farm and in the farm home. By participating in the planning and performing of necessary farm and home work the 4-H Club member achieves satisfaction for today and at the same time lays the foundation for greater service and therefore deeper satisfaction in the years ahead.

During the year ending December 1, 1943, Indiana 4-H Club members numbered 54,060, an enrollment making Indiana eleventh in the United States and the highest in the central region. These youthful farmers and homemakers completed 20,711 agricultural projects with swine, beef and dairy cattle, sheep, horses, poultry, corn, potatoes, and small grains. They carried on 44,662 home economics projects in the making of clothing, in baking, in food preservation, and in the preparation of family meals. The members participated in 175 Club tours, 743 Achievement Day programs, 19,938 local and county 4-H Club meetings, 31 district and county 4-H Club camps, 749 local 4-H leader training meetings, 87 county and district 4-H home economics judging meetings, 41 district and county 4-H agricultural demonstration meetings, 173 county and district agricultural judging contests, and 2,611 exhibits at the state 4-H Club fair. They obviously kept busy.

The county extension agents and teachers of vocational agriculture and home economics who direct the work of these 4-H Club members were assisted by 6,754 local volunteer leaders. Of these, 1,423 boys and 2,079 girls served as junior 4-H Club leaders, and 1,354 men and 1,898 women served as adult leaders.

Many urban readers of these pages describing in bald summary and cold figures the work done year after year under the general title of agricultural extension may fail to grasp the real significance of the movement. But one who can recall the life of American farmers during the first half of this century, who has seen grain cut with a scythe and cradle and, in the Southwest, seen that grain threshed on a threshing floor by the trampling hooves of horses, who has felt the loneliness of the great distances between farm homes in the stretches of the prairie states of the West, who has trudged along the sandy or muddy ruts of a raw earth road to a single-room school house, must marvel at what rural life in America has since become. It is true, of course, that agricultural extension work is not responsible for all the changes. The automobile, the paved road, and rural electrification and the rural telephone have been major influences. Nevertheless, it is rural extension that has kept those influences wholesome.

The farmer of today, who has risen grandly to the tasks demanded of him, is the result of training in the recognition of community responsibility and organization and in the application of the newest knowledge for improved agricultural practices. But most important, he is, he now knows, a member of a great state and national community. He is no longer a hardy individualist eking out a difficult living from an intractable soil. He is a citizen responsible for, and affected by, his nation's well-being.

Future Farmers of America. Future Farmers of America is the name of a national organization of boys studying vocational agriculture in public secondary schools. Under the provisions of the national vocational education acts, the Association supplements the occupational training the boy receives in vocational agriculture classes and develops in him valuable civic and social abilities. In 1929 the Indiana Association of Future Farmers of America was formed after a series of meetings sponsored by members of the Department of Education of Purdue University and the State Supervisor of Agricultural Education. Representatives of the Indiana Vocational Agriculture Teachers Association and of the Indiana Farm Bureau Federation took part in those meetings and in the organization of the Association. And since then, other prominent organizations, such as the Grange, have given encouragement and support.

The Association recognizes proficiency in farming and citizenship by the awarding of degrees based on achievement. The highest State degree is that of Hoosier Farmer; and the highest national degree, American Farmer. Through contests in public speaking, in essay writing, in chapter organization and chapter exhibits, in parliamentary procedure, in newswriting, the boys develop the ability to plan, lead, and work as members of groups, to express themselves concisely, to have poise, and to keep informed about community and national problems.

During these war years the Association has been exceptionally active. Many of its members, of course, are in military service; but many others are on the farms, using improved methods to produce food. A great number have participated in war bond and scrap drives, in the recruiting and the training of city youths for farm labor, in the recruiting of adult classes in food production, and in campaigns to increase conservation practices, such as the pooled use of farm machinery.

The Indiana Association has grown steadily in the fifteen years since its founding, and the present membership remains at about 1,500, although many vocational agriculture departments have been forced to close because of the loss of the teacher to military service. The loss in Association membership in the state has been smaller than the loss for the country at large, which has dropped from about 250,000 members to 180,000.

While the Indiana Association of Future Farmers of America is a vigorous youth organization with its own student officers and committees to conduct its activities, in the immediate background acting as advisory leaders are Purdue staff members of the Division of Education and Applied Psychology and the Office of the State Supervisor of Agricultural Education. Furthermore, the advisers of each chapter are teachers of vocational agriculture who frequently are graduates of Purdue or have taken graduate work in the University. Thus, the University furnishes a major proportion of the adult leadership, and each year the Indiana Association holds its state convention on the campus.

The School of Agriculture. The School of Agriculture does not confine its teachings to the campus, but likewise is active in promulgating agricultural skills and knowledges. During the year, for instance, members of the staff visited more than 150 secondary schools, and the staff of one department alone gave a total of 74 addresses to group meetings on subjects of wartime importance. They write many newspaper or magazine articles and give many special radio talks over WBAA.

The chief method by which the School works beyond the campus is, paradoxically, by working on the campus. Each year it arranges an eight-weeks agricultural winter school, to which come about one hundred young men and women to increase their skills. Those attending these schools have lacked either the time or the money to follow the full four-year course in agriculture, but by attending these intensive training schools they gain much of immediate practical value. Various special optional courses are given during these eight weeks. Last year the options were in general agriculture, animal husbandry, dairy production, and dairy manufactures. These specializations are of particular importance during wartime years. The value of these schools is shown by the ruling by the Director of the Indiana State Selective Service, who permitted farm boys in either the 2A or 3A classification to take the agricultural training during the winter months without altering their classification, provided that their absence from their own farms did not seriously impair the production of crops and livestock.

Farm Work Simplification. As reported last year, in December, 1942, a national project in farm work simplification was initiated and the Dean of the Graduate School at Purdue was named Director. Nearly $90,000 was allocated to the project by the General Education Board. The original agreement with the Board was to terminate on July 1, 1944; but since all the available funds had not been expended, the agreement was extended to July 1, 1945.

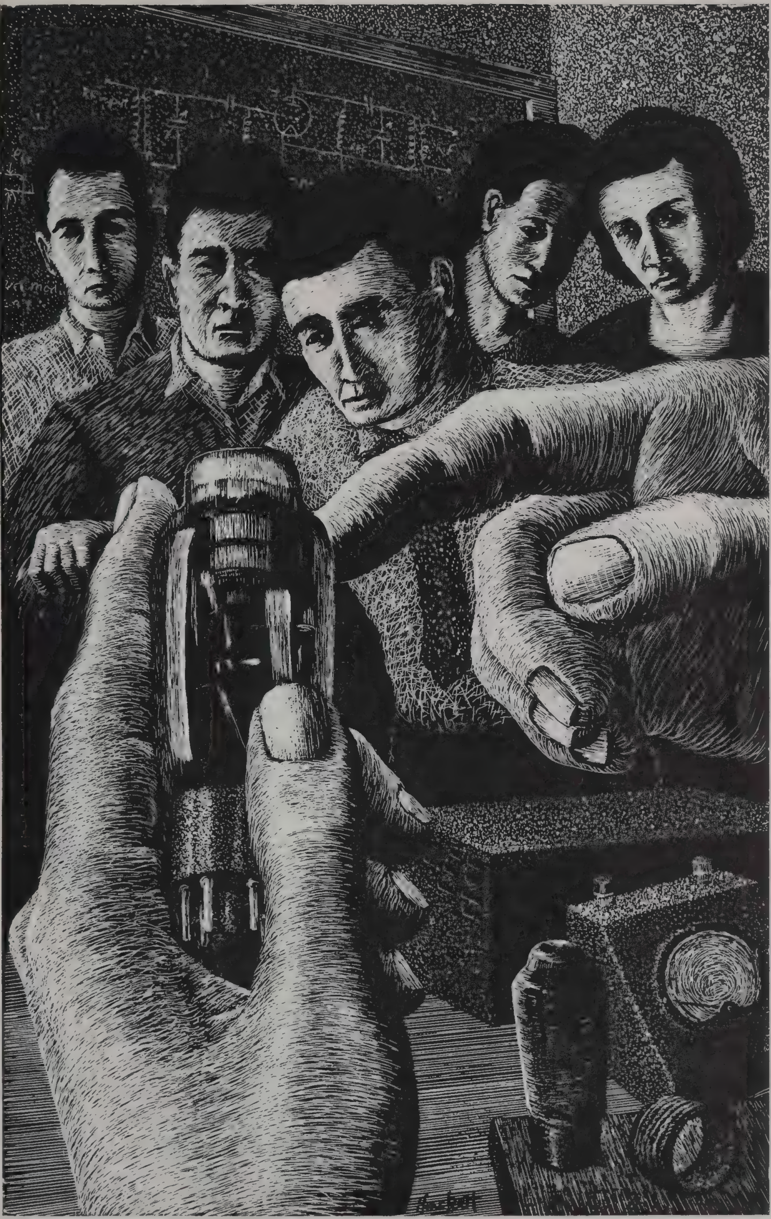
Work simplification may be defined as a scientific, systematic analysis of the ways of doing work in order to (1) eliminate all unnecessary work, (2) determine the easiest and most effective method and sequence of performance of necessary work, (3) determine the most convenient and economical kind and combination of equipment and facilities for effective job performance, (4) standardize, so far as possible, improved work methods and establish standards of performance as a guide for workers, (5) apply improved work methods and techniques and standards of accomplishment. The last objective, of course, required the preparing of instructions on how to do certain jobs most effectively and the demonstrating of the influence of improved methods on production and fatigue. And a major aim of any such project is the developing and teaching of general principles that may point the way toward improving work methods used on any job.

Agricultural research workers have studied objectively most of the factors influencing farm production, from farm organization to crop variety and animal nutrition. But relatively little attention has been given to the ways of performing the physical work associated with agricultural production. The national project, therefore, undertook to organize in selected land-grant colleges co-operative research projects jointly financed by the co-operating institutions and the General Education Board funds. To train experienced agricultural research and teaching personnel in work simplification research methods, to develop publications, films, and literature explaining the basic principles and objectives, to inform interested institutions and organizations of this new development, to help put new research findings into form for extension use, and to complete sufficient work simplification research and teaching projects during the life of the grant, to encourage experiment stations and other research and educational institutions to continue the work after the termination of the grant—these have been the chief efforts of the year.

Eleven land-grant institutions have co-operated with Purdue in the project. The research undertaken by any one of the colleges has been determined primarily by the need of the chief agricultural specialization in the district served. At the Colorado State College the research has concerned itself with beet, potato, and other vegetable harvests. At the University of Florida it is winter vegetable production and harvesting; at the University of Illinois, beef cattle feeding and asparagus and sweet corn harvesting; at Purdue, tomato peeling and picking, hog production, and canning factory operations; at the University of Kentucky, tobacco production, harvesting, and stripping; at the University of Minnesota, dairy production; at the University of Nebraska, haymaking; at Rutgers University, the potato harvest and poultry and egg production; at Cornell University, dairy production, hay, potatoes, and poultry; at Oregon State College, certain specialty crops, such as beans, hops, nuts, and fruit, and potatoes; at the University of Vermont, dairy production, hay, and corn silage; and at the State College of Washington, apple picking and packing. Detailed reports from the various colleges show that much valuable research has been done that has resulted not only in increased agricultural production, but more efficiency and less fatigue.

A single example will illustrate the methods used. Research workers at Purdue studied the hand-picking methods in ordinary use among tomato pickers and established rates-of-production methods. Analysis of motion pictures of a number of pickers showed that about 70% of the picking time was spent in moving the hands between the hamper and the vine. Consequently, an improved method of picking was worked out to lower this, as well as the over-all time requirement. The improved method, illustrated in the drawing at the beginning of this section of this report, was tested in the field to establish the output that could be expected from its use. Then the rules to follow in the use of this method were published as Extension Leaflet 258, *Making Movements Count in Picking Tomatoes*, and a 400-foot motion picture of the same title was released to help teach the improved methods. This leaflet is being used by several states, and six copies of the film have also been sold. It is interesting to note that the leaflet has been translated into German for the instruction of prisoners of war employed in the tomato harvest.

Besides the actual research done, six work simplification schools have been held in order to train workers to go out prepared to do similar research and to extend the findings of the project to farmers and workers where they could be put to immediate use.



THE UNIVERSITY'S AID TO WARTIME INDUSTRY

As was pointed out in last year's report, the growing demands of the war on American industry cast a disconcerting light upon some of the failures of American education. Too many American men and women were found to be seriously lacking in the kind of training that would fit them to serve adequately in a modern technological civilization. The old apprenticeship system had been largely discarded, and hundreds of thousands of young people had come to feel that manual labor, even highly skilled manual labor, did not carry with it the prestige of clerical jobs. Furthermore, the growth of the so-called service industries offered many types of positions that did not require training in any particular skill. In other words, American education in the primary and secondary schools had in many ways failed to keep up with the development of American industry and the intricacies of modern mechanisms.

America has been rightfully proud of the great numbers of its young citizens who have gone to college and of its many hundreds of thousands more who have completed high-school training. Nevertheless, it became clear that some other forms of training would be required if workers in factories were to utilize their potential ability. If they were to serve themselves and their country as effectively as it was possible for them to do, they would have to have intensive and specialized training in many of the techniques so important in the production of the mechanisms of war. The federal government made some effort to supply this training under what was called the Engineering Defense program of 1940-41. In 1941-42 that training program was changed in name to the Engineering-Science-Management Training Program. Later, in recognition of unhappy fact, it became the Engineering-Science-Management War Training Program, of which a class is pictured on the preceding page.

Purdue has participated largely and enthusiastically in all those programs, as will be described in the paragraphs below; but these years had made it apparent that the University should try to solve some of the problems mentioned above in a more permanent way. It should supply opportunities to the men and women permanently employed in industries to take longer, more detailed training to fit them for positions demanding more than the general high-school course and some years of experience in the shop. Such people, many of them of great potentiality, had for one reason or another been forced to forego the opportunity of a four-year college course. Yet, much that they would get out of college would be immediately applicable to success in their jobs; and, very likely, much that the college student is alleged to get from his college training was not essential. It should be possible, therefore, to separate the two elements of college education and to supply in shorter, intensive classes held after working hours the technical training needed. As a result, during the past year Purdue University has inaugurated what are called Technical Institutes specifically planned to fit certain needs of industrial workers in the manufacturing centers of the state.

Engineering-Science-Management War Training. The United States Office of Education sponsors and pays for the Engineering-Science-Management War Training Program throughout the country, but the actual administration and teaching is under the direct control of the various colleges. In Indiana, Purdue University is in charge of all the classes given in the program, except those in the Terre Haute and South Bend districts. Classes in the three fields indicated by the title are offered to employees of war industries free of charge.

During the fiscal year just past, 1943-44, the program enrolled nearly 10,300 students in 544 classes throughout the state at an expenditure of about $385,000 for administrative and direct teaching costs. This program shows a decrease of about one third in both numbers enrolled and expenditures from the program of the year before, when somewhat more than 800 classes were operated at a total cost of $514,000. The principal reasons for the decrease in the size of the program have been the longer working hours in critical industrial areas, a growing realization among workmen that high wages were available without further education, some decrease in war production, and a sharp reduction in the number of eligible trainees.

As the name of the program implies, the various classes are grouped under three main headings. Under the main heading of Engineering are given classes in chemical engineering, civil engineering, electrical engineering, mechanical engineering, and metallurgical engineering; under Science, classes in mathematics, physics, and chemistry; and under Management, classes in drawing, management, and industrial engineering.

More than half—in fact, 53 per cent—of the classes come under the third main group. About one sixth, or slightly over 16 per cent, fall within the Science group; and almost one sixth, or 14½ per cent, are in electrical engineering. The remaining one sixth is scattered among the different engineering courses, the most popular one being metallurgical engineering, which makes up nearly 7 per cent.

In general, classes are slightly smaller than before, the average number of students now being 19 in a class as compared to 22 previously. The type of student who was merely curious, and therefore temporary, is disappearing. Those who enroll are seriously interested in the work they are doing. Consequently, the classes, though smaller, are made up of better qualified students, with the result that a much higher percentage complete the courses for a certificate. Another change is interesting: an increasing percentage of the classes are in-service classes given within a plant to employees of that plant only. Formerly, such in-service classes were rare; now they form the largest percentage of the program. Many of these in-service classes are given on company time, and the companies purchase the textbooks and other material required for the students. That, of course, shows that there is an increasing appreciation by the various companies of the value of the kind of training given.

The program has tended to concentrate in the larger industrial areas. During the first year many classes were held in small, one-factory towns throughout the state. Students in those towns are no longer available. Instead of the nearly 100 cities that formerly supported classes, now there are only about 25; but these are the largest cities of the state, principally those in the Calumet District, and Fort Wayne, Muncie, Anderson, Richmond, Indianapolis, Evansville, and Jeffersonville. All the areas in the state showed reductions in activity except Indianapolis, where as many classes were held during the last year as before.

During the year the former Hoosier Athletic Club building in Indianapolis at 902 North Meridian Street was acquired on a two-year lease to serve as a center for the war-training classes, the technical institutes, and other extension classes. Its situation makes it easily accessible; and with but minor changes, it was possible to install a chemical laboratory, a laboratory for motion and time study, two drafting rooms, and about fifteen classrooms. The use of this building has been a factor in making the Indianapolis program the most successful within the state.

The Division of Technical Institutes. In order to make technical training more immediately available to those who cannot come to the campus for a full college course, Purdue University in 1943 established Technical Institutes in three centers in the state—Indianapolis, Fort Wayne, and Calumet. The Institutes give specialized intensive courses planned to meet the need for technically trained persons in the industrial cities of the state. The training differs from the engineering training of the University in that it emphasizes the applied and practical, rather than the basic or theoretical, phases of such education. The Division has been established as a permanent part of Purdue University and is operated in the same way as any other teaching program. All student grade records are deposited with the University Registrar and all financial matters are handled through the same procedures as govern other University business.

The courses cover the basic knowledges and practices needed by those who wish to qualify as engineering aides and technicians, such as laboratory supervisors, inspectors, junior draftsmen and designers, laboratory technicians, control instrument experts, specialists in electric circuits and machinery, and persons charged with responsibilities and skills of a semi-engineering kind. In the designing of the courses industrial leaders were consulted about the kind of specific technical information required for such positions, and many members of the instructional staff were drawn from local industries. Course administration, teaching material, and standards of instruction are, however, under the direction of Purdue University.

Three terms of class work, each twelve weeks in length, are offered during each school year. The requirements for admission are graduation from an accredited high school or the satisfactory completion of fourteen units of high-school work and the recommendation of the principal of the high school last attended. Those who cannot formally meet these requirements, however, but who feel qualified to complete the programs of study, may apply for admission. Any such application is reviewed by a counselor at one of the centers, who makes a recommendation to the Director of the Division for final action. Since the Division of Technical Institutes tries to render genuine training service to those who can profit by the training, it does not want to deprive anyone of such training merely because, by reason of a technicality, he fails to meet the formal requirements for admission. Successful experience in industry, it recognizes, is often an adequate substitute for high-school work.

For completion of the programs of study certificates are granted. Upon completing the first program and gaining a total of 48 credit points, the student is given a certificate as a Junior Technical Aide. If he continues and gains another 48 credits, he receives a certificate as Associate Technical Aide. And, after gaining that certificate, he may gain another as Technical Aide by completing a third program of 48 credit points.

The six fields in which students working for advanced certificates may specialize are technical chemistry, industrial design, layout, and drafting-room practices, technical electricity, mechanical principles and practices, industrial metallurgy, and production techniques in supervision and management.

During the first full year of its existence, Technical Institutes enrolled 216 students in the three centers, who were taught by a staff of 32 teachers. Of these teachers, 30 were industrial employees who were, or had been, actively engaged in the fields in which they were teaching.

More than two thirds of the students had had at least a high-school education, and 23% had had some work in college. A little fewer than one third of the students had failed to complete high school, but were enrolled on the basis of their industrial experience and proved ability.

Almost all Technical Institute classes are held in the evening to accommodate students who are employed. In fact, 96½% of the students enrolled are employed, of whom 82% were in industrial activities. The age range of the students was from 16 to 62 years. The average, 30 years, was what would be expected, since so many of the younger people are in military service. Ten percent of the students were women.

The Department of Engineering Extension. In June, 1921, the Board of Trustees of Purdue University authorized the establishment of the Department of Engineering Extension to carry the benefits of engineering and research to persons, industries, and governmental agencies of the state. The Department arranges conferences, short courses, and conventions held on the campus and in strategic centers throughout the state. It offers special services to off-campus groups and gives credit courses in engineering drawing offered in co-operation with Indiana University; and it publishes various informational bulletins.

During the years the activities of the Department have so grown that some have been set up as separate organizations and therefore are reported under the titles of those organizations. For example, the work of the Public Safety Institute and of the Fireman Training Schools is reported elsewhere. Listed in the Appendix, also, are the conferences and short courses sponsored by the Department. As a result, these paragraphs describing the work of the Department will necessarily be insufficient.

During the year the Department, with the co-operation of the School of Civil Engineering and the Indiana Section of the American Waterworks Association and the Indiana State Board of Health, organized six one-day meetings of waterworks operators at Dunes Park, at Lebanon, at Warsaw, at Atterbury, at Speed, and at Bicknell.

A member of the staff of the School of Civil Engineering has done considerable extension and research in sanitary engineering and has distributed a monthly newsletter called "Sanitary Engineering News." The program will be enlarged in the coming year.

One of the more extensive services of the Department is the training of industrial foremen. Since the program started in 1923, more than 600 industrial plants in 90 Indiana cities have utilized the services of the Department in the training of executives and foremen.

The training offered consists of a series of six meetings for foremen held regularly during the scheduled working hours of the plant. When the number of foremen in a single plant is not large enough to justify a conference within that plant, evening meetings have been organized at which the foremen of several plants have met together. The success of these conferences is shown by the fact that since 1923 more than 50 of the plants served have arranged for five or more series of such meetings.

During the year reported upon, such conferences were held in Indianapolis, Speedway City, Franklin, Columbus, Martinsville, and Seymour, with enrollment from a low of seven at Martinsville to a high of 89 in Indianapolis.

Because of the accelerated teaching program on the campus and the fact that the professor of highway engineering had been called to active duty as a captain in United States Army Corps of Engineers, the regular two-month program of highway extension and of meetings with county officials was not offered. However, the annual Road School was held in January as usual.

The extension work in janitor and custodian training had been curtailed since the custodian counsellor was on leave of absence for 21 months. In May he returned to the University, and the program of school visitations, conferences with public-school officials, superintendents of buildings and grounds, and public-building custodians was resumed. During his absence, a Fire School instructor spent some time with janitors and custodians of school buildings, assisting them with fire-prevention problems.

During the year, a specialist in pre-engineering mathematics and science, working under the Engineering Extension Department and the Division of Education and Applied Psychology, made contacts with many high-school administrators and teachers of mathematics and science. He addressed pupils in 95 schools and held 66 teacher conferences, at which he reached some 4,000 teachers. He addressed nearly 10,000 pupils in 207 meetings. Impressive as these figures are, they represent the contacts made only during the first half of the year.

A Course in Quality Control. In the first section of this report, mention was made that during the year 52 conferences and short courses of one kind or another were held on the campus. A selection was given to show how the University is responsive to and influences its environment. Since those conferences and short courses were convened on the campus, technically they do not belong in this section of the report. Some of them, however, have such immediate impact beyond the campus as to justify remark. A particularly interesting one of these was a week's short course in quality control by statistical methods for engineers, production executives, and other war-industry or government-inspection personnel.

Statistical methods of quality control have been developed during these war years by some of the nation's leading industries with the co-operation of the Army and the Navy and other government agencies. War requirements for increased production of the munitions of war that allow but the smallest tolerance of error have forced acceptance of every effective aid. When intricate instruments of warfare are being turned out by the hundred thousand through the labor, frequently, of hitherto unskilled workmen, some method of assuring quality was essential. Random sampling, obviously, would not do. In peacetime a faulty product could be returned and replaced; in war it might mean the loss of a battle. This new method of quality control by the use of the laws of statistics results in the improvement of the product, economies in the use of men and material, a decrease in the number of rejections, and in inspection costs, and obviously, therefore, improvement in the relations between the producer and the user.

Statistical methods of quality control utilize approved laws of normal variation to establish control limits within which variations due to remediable causes can be distinguished from the natural variations due to chance. The method makes use of quality control charts marking lower and upper control limits below and above a central line. Variations falling within the lines of the lower and upper control are due to the normal variations allowed for statistically. If they fall beyond those lines, there is lack of control. The construction of such control charts of course requires the use of tables and some simple calculations based on the science of statistics. To help spread the use of this method, the University organized a one-week school during the last week of April and the first of May under the direction of a professor in the Mathematics Department, who had the assistance of two men of the Office of Production Research and Development.

The intensive eight-day course was attended by 54 industrial and military representatives from Indiana and ten other states and two provinces of Canada and by 30 university men from all over the country.

The Placement Services for Men and for Women. It is obvious, of course, that the chief way in which the University aids industry—and by this term here we include the agricultural as well as the technological industries—is by supplying them a continuing flow of well trained graduates. This function of Purdue, as of other universities, has become of increasing importance with the growing intricacy of our economic civilization. No longer can a college consider that it has fulfilled its duty to its students when it has given them a diploma and its blessing. The tasks to be done in a modern technical world are so multifarious that a new alumnus needs help and guidance in finding an opportunity where his skills may be put to the best of advantage both for himself and for his nation. That assistance at Purdue is offered to the graduate by the Office of Personnel of the Schools of Science and Engineering, the Placement Service for Women, the Office of Teacher Placement, and the Offices of the Deans of Agriculture and of Engineering and of Pharmacy.

The numbers graduating from agriculture and pharmacy are so small and their training is so specialized that the finding of positions offers but little difficulty. The success of the offices of the deans is shown by the fact that in normal times placements average close to 100%. The finding of employment for the hundreds that graduate yearly from the School of Science and the Schools of Engineering is another matter. Their training fits them for many different kinds of jobs, and for them the placement offices are essential.

During these war years the problem faced by the Personnel Service for Men has been both simplified and complicated. So large a proportion of Purdue's graduates have gone immediately into the armed services that the finding of employment for them was simplified. At the same time, so many appeals to the University from industry were received that the office's efforts to satisfy them were greatly complicated. Industrial men literally besieged the office. Since the office could not begin to supply the demand, it placed its efforts on improving the relationships between the University and these industries, with, it is hoped, marked success, for these industries are coming back to Purdue for trained men after the war.

In last year's report it was said that the placement office had persuaded many industries to interview young graduates even though they were to be inducted into the armed forces within a week or two after their graduation, with the view of employing them upon their return. That policy has been successfully continued and even extended, for in many cases companies, through the office, have written to men in the services about post-war employment. That effort has been rewarded by increased morale among Purdue's graduates in the service and by an increased warmth of feeling for their alma mater.

During the year a good many hundreds of young men from other universities were on the campus in the AST and the V-12 programs. The placement service gave these men the opportunity of using the office on the same basis as Purdue students in civilian courses. It is needless to say that they were most appreciative.

Recognizing that the office will be called upon for the important task of meeting calls for alumni after their return from the service, it has made an interesting beginning on the problem. For two important industrial concerns the office reached certain graduates now in service who had been definitely interested in those companies before they were inducted or volunteered. To one of the companies it was suggested that letters concerning post-war employment come from the placement office, and to the other that the letter originate from the company with a reference to the office as having suggested the procedure. The first letters, to 28 men stationed all over the United States and in practically every theater of war, brought nearly 100% of replies. Without exception, the men expressed enthusiastic appreciation of the University's continuing interest. The two industrial concerns were so gratified with this approach to the problem that the plan is being extended to every concern listed in the office files.

During the year 905 men and women graduated from the University. Of these, 448 went into industry or continued with graduate work, and 326 went into the armed forces. Of these 905 men and women, 507 graduated from the engineering schools. Of those, 235 went into industry or graduate work and 256 into the armed forces. During the year 278 women were granted bachelors' degrees. Of these, 189 reported employment as of June 30. About one-fifth were teaching and the rest were engaged in various business fields. Those not reporting were doing graduate work, were married and therefore not interested in immediate work, or were not registered for placement. In addition 276 alumnae registered with the Placement Service for Women during the year, and 48% were assisted in securing positions.

ENGINEERING AND SCIENTIFIC RESEARCH

At the beginning of the second section of this record of Purdue's year, it was pointed out that no modern university can consider itself merely a conservatory of learning. One of the chief functions must be the production of knowledge as well as its inculcation. Perhaps here those remarks should be amended, for more and more educators are realizing that the effort to produce new knowledge aids in the learning of the old. Research is definitely part of the educational process.

As boys and girls in primary and secondary schools study textbooks that more or less accurately record the knowledges discovered in the past, they are likely to feel that the intellectual achievements of which they hear came as sudden strokes of illumination to certain gifted men and women. The long process of accumulation of minor bits of knowledge, the laborious steps taken towards achievement, are not recorded. And consequently, to the students education may seem to require that they be merely sponges. If, however, when they come to the University, they study scientific techniques and are allowed to participate, however humbly, in the search for further knowledge, they get an entirely new idea of education. Education becomes a process and not a reward.

There is another point of view from which research is valuable to education, however that may be interpreted. The teacher who is himself involved in research becomes less pontifical; he knows that he has not the final answer. He knows, furthermore, that the final answer will never be discovered. But his knowledge of the slow history of scientific advance shows him that man is making an ever-closer approach to some final answers. A research scientist must be humble; and he must also be optimistic—two qualities essential to successful teaching. The old dispute between the teacher and the research man is seen to be essentially needless. The scientist searches for new facts; the teacher, if he is worth his salt, is searching for new methods—both are researchers, but in different fields. The real problem of education is that of collaboration and correlation.

That scores of Purdue's teachers are doing valuable research work in the laboratory, that others are digging into the facts of human behavior and human relationship, and that still others are unearthing the undiscovered data of history and literature goes without saying. Unfortunately, during these war years most of the results must go without saying also. Little can be said definitely, and the reader must take much for granted in this admittedly sketchy account.

The Purdue Research Foundation. In 1928 the Department of Research Relations with Industry was created, and two years later the Purdue Research Foundation was incorporated. The foresight evident in those two events has been justified by the improvement and expansion of the University's scientific usefulness that have resulted. Both these agencies have, of course, continued during the year under report the energetic, constructive policies of promoting both utilitarian and fundamental research through co-operation with industry and the national government and thereby encouraging the creative abilities of both staff and students. Annual records are likely to give prominence chiefly to the practical, cumulative results of the research done; but the long-range view shows that the Department and the Foundation have served as the chief productive influence for the development of the Graduate School, which year by year has attained a position of increasing worth to the whole institution.

From the modest funds supplied for the first experimental enterprise of fifteen years ago, there has come a lengthened and broadened program involving the expenditure of more than a million dollars, principally furnished by industry. The capital assets of the Foundation, amounting to a mere $50,000 in 1930, have been increased to $3,000,000.

Today the Department and the Foundation comprise a major service, that of scientific supply for the University and industry. They enable the University to reach its highest goals of training capable men and women in effective search for scientific truth—the truth that is the key to the increased productive power of the nation. At the present time, the continuing development of the Purdue University airport and of the housing research campus, both focal centers of constructive research, are especially significant.

The Engineering Experiment Station. Most of the experimenting done by the staff of the Schools of Engineering is sponsored by the Engineering Experiment Station and much of it in co-operation with the Purdue Research Foundation. Through research projects for the armed forces, the National Defense Research Committee, and various war industries, the University has made a major contribution to the war effort. Twenty-four research projects under 26 contracts with the federal government are now under way, and more than 20 research projects are being carried on in co-operation with industry. Most of these, of course, are secret and cannot be even vaguely described. Those that can be will be given under the headings of the various schools.

The School of Electrical Engineering. Perhaps the most dramatic project that can be described was undertaken by the School of Electrical Engineering during the year. That was the installation of a large, modern, alternating-current network analyzer, or calculating board, as it is popularly called. On this board, large electric power systems can, in effect, be set up, with their electricial properties all to exact scale, and on it the functioning of the systems may be studied and determined.

Many of the technical problems involved in the design and operation of power systems are extremely complicated, and their solution by ordinary mathematical methods is either very tedious and time-consuming or impracticable. Some of the more common of these problems are power flow in various parts of a system, the proper location and size of power plants and other power equipment, the size and location of interconnecting transmission lines, the determination of the effects of short circuits and other faults, feasibility of system interconnections, and power-system stability. Altogether there are some 75 or 80 such problems that can be solved readily on this board.

In its use as a mathematical device, the equivalent of several hundred simultaneous equations containing an equal number of unknown quantities can be solved in a comparatively short time, the answers being read on electrical meters installed in the calculating board electrical circuits.

The equipment itself, which consists of many thousands of component parts, is installed in 20 large cabinet-type metal switchboards in a room in the Electrical Engineering Building. It provides facilities for representing a power system that has as many as sixteen large power plants, 160 transmission lines, and many substations. The interconnected power systems in the state of Indiana can all be set up at one time on this board. The board is one of the largest in existence and is one of but four in the United States that are available for general service to the public.

The cost of the board, more than $50,000, was borne equally by eight co-operating sources, the University and seven Midwestern power companies. The annual operating costs are likewise to be shared by the participating organizations; but it is expected that the operating costs will in part be paid for from rental fees for services rendered to other power companies. Under the terms of the co-operative agreement, the board will become the property of the University in fee simple at the end of ten years.

The acquisition of this board will result in important advantages to the University. It will bring many power-company engineers with their live problems fresh from the field to the campus for protracted periods of time, and the teaching staff and upperclass and graduate students will have opportunity to work with these engineers on practical problems. Educationally, the result cannot be otherwise than helpful and stimulating to both staff and students.

The staff of the School has done other interesting research. They have completed three wartime projects of a secret type and are now working on two other such projects, all of which were sponsored by governmental agencies. In addition, important researches on the electrical characteristics of live wires and on methods of maintaining the quality of transformer oil are being carried on under the sponsorship of industrial companies.

The School of Civil Engineering. In the civil engineering section of the Engineering Experiment Station the staff of the Joint Highway Research Project has expanded its soil studies and established the relationship between pavement failures due to excessively heavy loads of war material and certain types of soils. This investigation makes possible the elimination of such failures by changes in design in the future. Performance surveys have been made that indicate that certain gravels and limestones are unsuitable for use in concrete pavements. A series of reports on traffic speeds on Indiana highways has been written.

A major contribution to the war effort has been the development of a method of identifying soil types from aerial photographs, even of unexplored territories. The immense importance of this development was recognized when one member of the staff was asked to assist the Engineer Corps of the United States Army in one of the most active theaters of the war.

Thirty reports on existing and proposed airport sites have been submitted to the Civil Aeronautics Administration, and one study on soil stabilization for runways has been completed and a report thereon submitted to the same administration.

The research and extension program has been developed in sanitary engineering, and an expert is available to assist water-purification and sewage plant operators in solving problems in plant operation.

The School of Chemical and Metallurgical Engineering. Two very encouraging research projects were conducted for the War Production Board. One involved the lead coating of steel sheet and resulted in the development of a successful process which was ready for commercial application when the zinc situation became so much less critical that supplies of that metal were released for galvanizing. By the process discovered, a highly satisfactory coating of lead-zinc alloy can be applied to sheet steel. It is believed that this type of coating, because of its resistance to atmospheric corrosion and its high ductility, will find application after the war.

The other process, for the treatment of garbage, is also ready for commercial application. In this process the garbage is dehydrated at the relatively low temperature of 165° F. with a solvent. It yields as product a high grade of animal feed and a fat, the latter of which may be used for the manufacture of either explosives or soap. Plans are now being made to erect a plant at Indianapolis for the treatment of 25 tons of wet garbage per day.

The School carried on certain highly specialized inspection and testing for a local plant engaged in the manufacture of an instrument for the armed forces, since no one in the organization was competent to carry on the work and no such person could be obtained.

The research work on the hydrogenation of coal was actively supported by the Indiana Gas Association during the year. Finally, however, because of the exigencies of the war it became impossible to keep a young man on such a long-term project. The work will be continued after the war. Members of the staff have been active in other industrial projects. One is on a War Production Board committee which meets once a month in Washington. He serves also in a consulting capacity with the Tennessee Valley Authority and the Bohn Aluminum and Brass Company. Another is consulted frequently in the production of special organic chemicals, and a third has a number of research students completing their theses for the doctorate in the plants of J. S. Seagram and Sons, Incorporated.

The School of Mechanical and Aeronautical Engineering. Confidential research work for the Army Ordnance Department, the Army Air Forces, and the National Advisory Committee for Aeronautics has absorbed the efforts of about 40% of the members of the staff during the year. That work, of course, cannot be described.

The relative corrosion resistance of various alloy steels to high-temperature steam was studied and made the subject of the fourth of a series of papers published in the *Transactions of the American Society of Mechanical Engineers* during the past ten years. The increasing use of high-temperature steam in modern power plants for industrial processes, such as that for the manufacture of synthetic rubber, has made the results of this investigation of particular value. Two members of the staff have opened up a new field for investigation by doing pioneering work in the solution of problems in mechanical vibration by electrical analogs.

The Department of Chemistry. Butyl rubber, because of its unusual impermeability to gases, has replaced all other materials for the fabrication of inner tubes. However, the quality of the commercial product is reported to fluctuate widely, presumably because it is not polymerized by the emulsion techniques employed on all other synthetic rubbers. The long-desired production of butyl rubber by polymerization was accomplished at Purdue during the past year as the result of an invention by two members of the staff of the Department.

A very interesting line of syntheses, including gums, pectins, colloidizing agents related to the alginic acid of seaweed, and vitamin C, has been opened up by the conversion of the primary alcohol groups of starch to carboxyl.

The war research program in the Department of Chemistry was still further expanded over that of the year before. Increased requirements for working facilities resulted in the re-equipping of the old locomotive testing laboratory on the campus for chemical research for the United States Army. Purdue, it is gratifying to know, has developed processes in competition with some of the best university and industrial research laboratories of the United States and our allies, processes that are going into commercial production for the war effort and replacing those developed elsewhere.

The Department of Physics. Although some 62% of the staff of the Department of Physics has been engaged here on the campus or elsewhere in secret physics research for the war effort, nevertheless a certain amount of research has been continued.

In the Division of Structure Research with X-Rays and Electron Diffraction the structure of tellurium as a function of temperature was studied from liquid air up to 300° C. Throughout this range, the structure remains unchanged, and any shift in line can be explained as due to the expansion of the lattice. During the preparation it was observed that a metallic deposit can be obtained which under the microscope and to the naked eye appears to be without any structure and similar to carbon black. In electron diffraction experiments it has been possible to show that this deposit has crystal structure and can assume a definite orientation. Thus a complete quantitative explanation of the pattern has been possible.

In the Division of Nuclear Physics during the year the cyclotron has been completely overhauled and the oscillator has been rebuilt. In a special investigation its characteristics have been determined. A special automatic robot for cyclotron control has been built and tested, and the properties of the magnetic field have been investigated. A special selector for counting techniques has been developed and tested.

In the Division of Theoretical Physics numerous problems of diffraction of micro-waves have been studied, and in the Division of Spectroscopy the work on hyperfine structure has been continued. One member of the staff has extended his methods of quantitative spectroscopic analysis to the investigation of certain alloys and has been able to obtain an accuracy with an error of about 5% in this field.

Under a grant from the WPB a number of men on the staff have designed and built a new type of equipment for the investigation of reflectivity and behavior of various materials in the infra-red region.

The Department of Biology. Most of the members of the staff in the Department of Biology are continually busy with various research problems, problems that continue from year to year and so are a little difficult to discuss in an annual report.

In the field of botany one man is studying the inhibitory effects of various soils and soil extracts upon the growth of *staphylococcus aureus*. the biological and physiological qualities of a formaldehyde-tolerant fungus, clover anthracnose and the causal agents of that disease, and the diseases of grasses on golf-link greens. In addition, he has prepared a new and unique key to the fleshy fungi and is working on a project to discover potent strains of *Penicillium notatum* by genetic manipulations of the fungus. Another man is studying the effect of the addition of sugar and other organic compounds upon the respiration of excised maize roots under aseptic conditions. Another has investigated the morphology and development of the seed of the tulip tree, the genetic constitution of *Gleditsia tricanthos* f. inermis (Pursh) Fasset, a thornless locust growing in Indiana, with a view to determining the ratio of thornless to thorny progeny among its seedlings, as well as the degree of thorniness, and the anatomy of an imperfect seed coat in soybeans in a strain that exhibits such an imperfect seed coat. Still another is devoting much effort to cytogenetical investigation of the use of variant chromosome-numbered wheats in a study of disease resistance, in the hope of forming a variety of wheat which combines as many types of resistance as possible and will be more resistant than any now grown.

In the field of heredity, one of the members of the staff is doing extended work on the effects of ultra-violet irradiation on pomace flies and has made an experimental study of the methods of ridding Drosophila cultures of mites.

In bacteriology, two men are experimenting with the decomposition of cellulose by bacteria, and another, with the aid of several graduate students, has investigated the bacteriology of stored dried egg powder and developed a technique that has already served to standardize the testing of this product in the laboratory. He has also studied resistance of the domestic fowl to bacillary white diarrhoea.

In the field of parasitology one professor with his students has continued research upon the trematode parasites of animals from the fresh waters within easy accessibility of the University. He has sent parasitologic material to several of the medical schools for use in teaching men being trained for combat areas. Another member of the staff has completed research studies on *cercaria szidati*, sp. nov., a new furcocercous ceraria of the vivax type. Two graduate students and one undergraduate student are investigating the undescribed life history of a trematode parasite. and another undergraduate student is beginning a survey of the larval trematodes of a creek near Attica, Indiana.

In physiology one of the professors has prepared seven or eight papers as the result of research. These papers, now in press, were in each instance prepared with the aid of students who had done considerable research and are an excellent illustration of the value of research in teaching. The papers are highly technical and labor under such titles as: "The Influence of Glycotropic Substances on the Survival of the Primitive Respiratory Center in the Ischemic Rat Head," "The Influence of Certain Aliphatic and Aromatic Sympathomimetic Amines on Respiratory Center Survival," "Survival of the Respiratory Center of the Non-premedicated Ischemic Rat Head as a Function of Body Weight and Age." "Drugs Affecting the Survival Time and Number of Gasps of the Ischemic Decapitated Rat Head," "Further Observations on Factors Influencing Hypoxic Resistance of Mice," "The Inhibitory Effect of Certain Napthoquinones on the Hemorrhagic Action of Dicoumarol," and "Physiological (Hypoxic) Decortication of Birds." It is only fair to point out that these titles mean no more to the editor of this report than they will to the great majority of readers.

In addition to the researches named, three so-called XR Fellowships under the Purdue Research Foundation have been assigned to the Department. One is for investigation of the effect of different sources of nitrogen upon boron metabolism in tomato plants. Another will investigate the decompression effects under simulated high altitudes on anoxic survival in laboratory animals. And a third is on the decomposition of cellulose by bacteria.

The School of Pharmacy. The graduate and research programs in the School of Pharmacy have been extended during the year. All the projects under investigation are in the interest of public health. In all researches the standardization of drug products by chemical, pharmacological, and pharmaceutical methods is very important, since the standards are often adopted on a state- and nation-wide basis to control the quality of preparations sold to the public.

Very briefly, the projects may be classified as follows: In pharmaceutical chemistry they consist of the synthesis of new compounds, as, for example, the sulfonamide-type drugs, and the isolation of the active principles from vegetable and animal drugs, for example, the phytochemical and pharmacological study of Veratrum Viride. In pharmacology, studies are made of the physiological action of known and unknown drugs; and in pharmacy the technology of manufacturing processes and the formulation of new and more effective products are under investigation.

During the year the School's researches resulted in three patent applications for (1) new synthetic compounds having anesthetic activity, (2) new synthetic compounds having ergot-type activity, and (3) new stable forms of solution for the application of sulfonamide-type drugs.

Housing Research. During the first half of the period covered by this report studies on war housing were done under Purdue Research Foundation Fellowship No. 206 for the Office of Production Research and Development of the War Production Board. That work was completed by January 1, 1944, and since then special studies have been made on the development of an entirely new technique in the heating and cooling of homes under Purdue Research Foundation Fellowship No. 227A, likewise sponsored by OPRD. In this study the department has had the co-operation of a member of the Physics Department in developing data.

Likewise during the year, under the sponsorship of the Vermiculite Research Institute, a new type of house, constructed of a drawn-steel framing encased in a low-density Vermiculite concrete, was studied. In addition to the general studies on the construction and cost of construction of the house, elaborate investigations of the cost of performance of three panel-type heating systems has been made. For this investigation the Brass and Copper Research Association has appropriated $15,000 for a two-year study of the heating systems.

In the latter half of the year the plans and specifications for twelve houses designed to meet the post-war requirements in the small-home field have been made. It is hoped that those houses can be constructed and studied during the coming year. During the same time the necessary data which will permit the creation of numerous research fellowships on various housing problems have been established. One is for the fellowship sponsored by the Brass and Copper Research Association. Another is for the development of a series of moderately priced homes for the Couzens Foundation of Pontiac, Michigan. And it is expected that in the fall of 1944 research investigations on the use of large glass areas in housing will be sponsored by the Libby-Owens-Ford Company. The Henry Kaiser Company is likewise interested in the establishment of a fellowship for research on the heating, wiring, and plumbing of houses developed by the housing division of that company.

Research in Industrial Vision. Research in industrial personnel selection and placement has shown that visual skills affect quality and quantity of work done and often, also, susceptibility to accidents among industrial employees. The analysis of several thousand scores made by employees on vision tests in such industries as the steel, paper, hosiery, electrical fixtures, radio, aluminum, piston ring, and precision-machine industries reveals that different jobs require quite different patterns of visual skill. Such analysis shows, furthermore, that older employees, although they may not be adapted visually to all jobs, are frequently well adapted for some jobs and that from 20 to 40% of the personnel of the average industrial plant do not have the visual skills demanded by the work they are doing.

These and other facts concerning the vision of industrial employees have been revealed by a five-year research program sponsored jointly by the Division of Education and Applied Psychology and the Bausch and Lomb Optical Company. The research men have kept in constant touch with the Committee on Industrial Vision of the American Academy of Ophthalmology of the American Medical Association and a corresponding committee of the American Optometric Association. As a consequence of the findings, an Industrial Vision Institute has been established at the University. It is a three-week intensive course for representatives of industries and covers the basic principles of visual skills, the methods of correlating visual-skill test scores with job performance, analysis of jobs according to visual requirements, and proper methods of identifying present or potential employees who should have a professional eye examination to insure their visual fitness for the work.

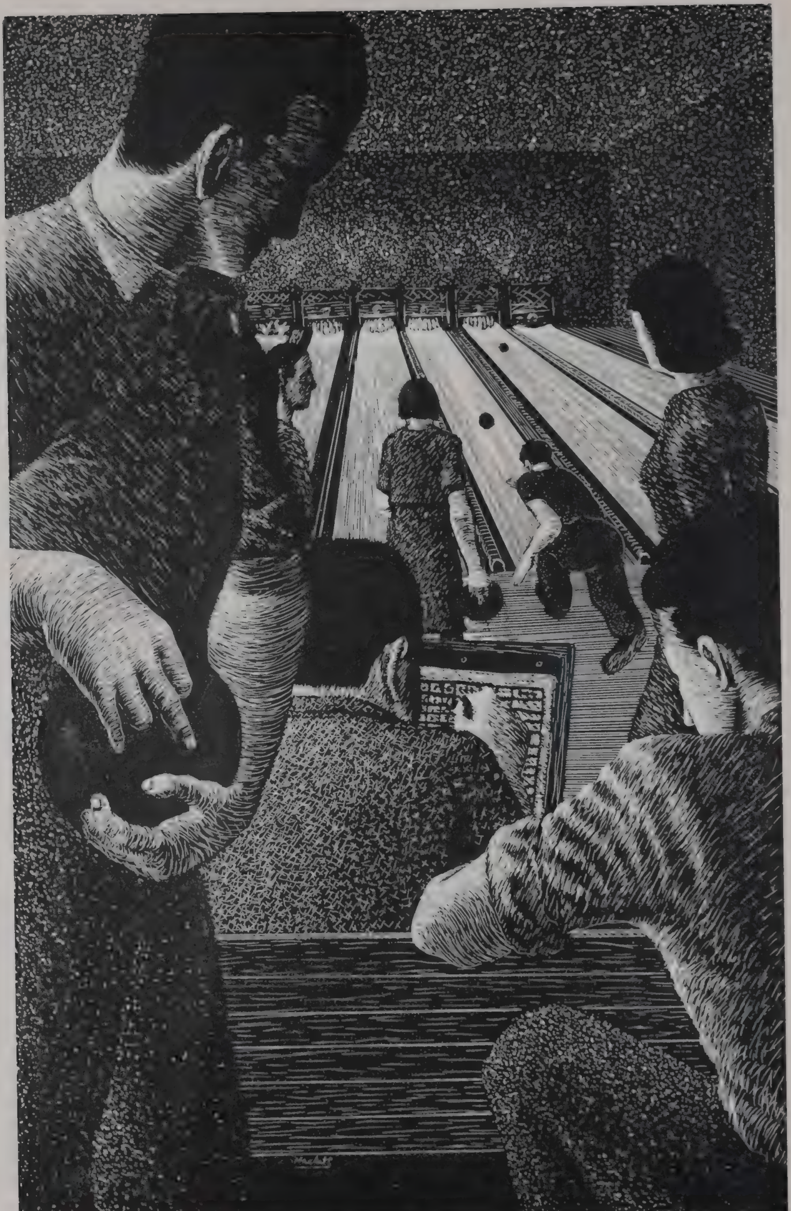
Those attending the Institute are given intensive training in the administration of twelve visual-skill tests incorporated in a single precision instrument—the Ortho-Rater—developed by the Bausch and Lomb Optical Company. These tests include all that are significantly related to job performance and that may be given satisfactorily by trained laymen. The tests are not diagnostic of visual conditions but deal only with visual skills or visual performance.

The work so far has produced six significant articles in technical journals.

Industries are realizing that it is useful for the experts from the campus to visit the plant itself and consult with those concerned with these visual problems. Among the organizations so served are the Perfect Circle Company, the Eastman Kodak Company, the Sperry Gyroscope Company, the Revere Copper and Brass Company, the Western Electric Company, the Phoenix Hosiery Company, the Real Silk Hosiery Company, and the International Business Machines Company. It takes but little imagination to appreciate the far-reaching results of such research in promoting human well-being and human contentment.

Research in Applied Psychology. The staff of the Division of Education and Applied Psychology has done research in other areas in which psychological knowledge can be applied practically in industry. More and more, industry is realizing that many of the problems that create friction within an industry are caused by either ignorance or oversight of human factors. The adjustment of an employee to his job, whether it demand a manual skill or deal with the many facets of human temperament, is obviously basic to contentment; yet in the past there has been a tendency to lump all workers together, to fail to consider the multifariousness of human individuality. Furthermore, the cause of discontentment is likely to be misunderstood by the one who finds himself unhappy and is too liable to be misconstrued as economic injustice. Psychological research has, then, a great future in creating industrial harmony.

Some indication of how the members of the Purdue University staff in psychology have been attacking these problems is shown by merely listing six subjects of their study: (1) A short mental alertness test for use in employment offices has been constructed and evaluated. (2) Studies have been made in job evaluation in relation to the hourly rates paid. (3) There has been developed a technique for training disc-cutter operators. (4) Finger-dexterity scores in an ordnance plant have been analyzed by "quits." (5) New methods have been devised for recording graphically operators' performances. And (6), perhaps the most interesting, work is being done on the measuring of the quality of industrial supervision in the field of human relations.



MISCELLANEOUS SERVICES OFF THE CAMPUS

In the opening paragraphs of the section entitled "The University Beyond the Campus" it was pointed out that the modern university can no longer consider itself merely a retreat for scholars, that a university now must create knowledge as well as conserve it and pass it on. The recognition of that duty by modern colleges and universities has inevitably led them to accept another obligation. Since they no longer feel that they are fulfilling their responsibility if they make merely scholars, they must inevitably try to develop the full man and the full woman. Mental alertness, physical well-being, and psychological integration must all go together to make the total man who is best fitted to be a citizen of a healthy democracy. But a university recognizes that its students have a long start in becoming what they will be long before they enter the university, and likewise that most of their lives will be spent away from the campus. Consequently, Purdue University feels it must concern itself with many and varied aspects of the life of the citizens of Indiana, both before they come to the University and afterwards, and even if they don't come at all.

In this section will be told some of the things that the University tries to do in the several departments of human living.

Industrial Recreation. It is platitudinous to say that in a technological economy such as that in the United States more and more people have more and more leisure time. So much has been written and said of recent years about the need for cultivating in the citizenry the habit of healthful recreation that it sometimes seems as if we assumed that recreation was the most important activity in life. There undoubtedly has, at times, been overemphasis on recreation. Nevertheless, this exaggerated concern has brought out some facts about recreation that are frequently overlooked.

Many people have perhaps felt that recreation is something with which to fill the hours not devoted to profit-producing work—in other words, that recreation was something to keep people out of mischief, that "the need for healthful leisure-time activities" is merely a highfalutin, new-fangled way of saying that "Satan finds work for idle hands to do." In truth, of course, recreation is much more affirmative. It is productive;

and one aspect of its productiveness has led to the establishment within the Division of Physical Education for Men at Purdue University of an industrial recreation section. The proper kind of industrial recreation produces contentment, efficiency, and safety.

The Athletic Institute, Incorporated, had been attracted by pioneering work in the field of industrial recreation that had been done by a member of the staff during the past six years. It suggested, therefore, to the Board of Trustees of Purdue University that the industrial recreation section be established; and that suggestion was acted upon on July 1, 1943.

In the first year of its existence, the newly created section, which has been financially supported by the Athletic Institute, has made substantial progress in arousing nationwide interest in the values and practical possibilities of industrial recreation programs. A good share of the work of the section during this initial year has been devoted to planning and promoting a series of four clinics and conferences at which the techniques of industrial recreation have been presented to some 600 industrial executives.

The first clinic was held at Purdue University on October 25-30, 1943, and attracted 92 persons from 12 different states. This first clinic established the background for three similar clinics, in which the University has actively co-operated: a two-day conference at the University of Pennsylvania, a three-day conference in co-operation with the Alabama Polytechnic Institute at Auburn, Alabama, and a one-day meeting at Boston held under the joint sponsorship of the Chamber of Commerce, the Associated Industries of Massachusetts, and the New England Council for Economic Development. As a result of this series of conferences, a number of industrial concerns have already taken steps to reorganize their industrial recreation programs on the basis of research carried on at Purdue University.

The professor of industrial recreation has visited 28 different cities in industrial areas during the year for consultation and conferences with industrial leaders on recreational administration and research problems. He has also prepared a number of articles on various phases of industrial recreation, which have appeared in nationally circulated trade and professional magazines, and has made more than a score of speeches on the subject. Interestingly enough, this ground-breaking work has already resulted in requests from two labor organizations for help in establishing recreation associations for industrial workers, and four other educational institutions are already planning to do work in the same field.

Six different research projects in the field are in progress of investigation. Several of them promise to develop material of considerable significance for post-war industrial recreation planning. To the layman, research in industrial recreation may seem impossible or unnecessary; but a very fruitful field for investigation is the result of the recreation program in a lessened number of accidents, a result that has already been discovered in some industries and that surely justifies further work.

Public-School Hearing Testing Program. In 1938 almost 2,000,000 children were given hearing tests in 1,000 cities in 125 counties of the nation. Analysis of these tests showed that six to seven percent of the children showed some hearing deficiency. Hearing tests conducted in Indiana during the following year revealed large numbers of school children with hearing losses severe enough to interfere with their reception of normal oral classroom instruction. These facts were startling enough to cause action. In 1941, therefore, the Indiana legislature enacted a law requiring city school boards and township trustees to give school children scientific hearing tests once a year and to provide corrective devices and instruction to any child whose hearing was found to be impaired.

Public-school administrators were thus confronted with the problem of securing scientific equipment and adequately trained speech and hearing therapists to carry out the provisions of this act. The difficulty of putting such a program into immediate operation led the State Superintendent of Public Instruction to ask the four state institutions of higher learning to co-operate in instituting a hearing testing service for public schools until they could organize such a program themselves and to provide academic training for persons who wanted to qualify for licenses as speech and hearing therapists.

Purdue University at once responded to this request and set up under the supervision of the Speech Clinic a public-school hearing testing program and provided courses required for the hearing testing license. During the school year of 1941-42 the supervisor of this program tested the hearing of more than 21,000 school children in the state and recommended educational procedures for those found to be hard of hearing. All those with serious hearing deficiencies were referred to family physicians for physical examination. Part of the cost of this service was borne by the school system for which the testing was done, but the University contributed to the financing of the project by purchasing special audiometric equipment and employing a trained supervisor.

When this project was undertaken, it was thought that it would be but a year or two before the public schools would be equipped to administer their own hearing tests. The demands of the war on industry and personnel, however, were so great that scientific testing apparatus became unavailable and few people were trained for the position of supervisor. In 1942, therefore, the state superintendent requested the four state institutions to continue the service. At the same time provisions were made to extend it to provide a more complete testing program than was carried out the previous year.

During the school year of 1942-43 the Purdue supervisor tested about 29,000 children in nine county and seven city school systems in the state. Retesting of those who showed a hearing loss brought the total number of tests given to more than 43,000.

The 1943-44 public-school year was so shortened in most rural schools as to reduce the available testing time by one month. Nevertheless, about 20,000 children were tested in 125 schools in eight counties, and an additional 7,000 were tested in nine city school systems. Retesting brought the total number of tests to more than 32,000.

Since the emergency created by the war will probably last at least through the current year, plans have been made for continuing the service and the program has been expanded to include a consulting service to parents, teachers, and family physicians to provide a better follow-up service for the rehabilitation of children found to be deficient in hearing.

The State High-School Testing Service. The Division of Educational Reference of Purdue University has now completed its thirteenth year of the state high-school testing service. This service does not test high schools, as the title might seem to indicate, although, in a certain sense, that testing occurs. What the service does do is to construct objectively-scored tests in various subjects, which are sold to high schools for use in the examination of their pupils. These tests are built anew each semester by experts in both the collegiate and the high-school teaching field. They are printed at the Division of Educational Reference and sold by the Division directly to the high schools. During the year herein reported, 48 such tests were constructed for each semester—a total of 96 different tests. The sales for the year totalled 196,489, an increase of 12,286, or 7%, above the sales for the year before.

The chief objective towards which the work of the testing service is directed is that of educational guidance of the individual pupil. This has a twofold purpose—adequate counselling aimed at a useful, integrated high-school course and at developing a background basic to achievement in collegiate, university, or technical advanced schooling. When a counsellor has the records of a high-school pupil on several tests immediately before him, he can see in which subject the pupil stands high or low, and from these records he can advise on a real basis about the courses the student should take, the reviews he should make, the change in his curricula. He can thus help the pupil to clarify and define his goals, and consequently can assist him in developing into a useful, democratic citizen.

A lesser objective of this testing service is that of inter- and intra-school comparisons. From the norms established on results of the tests computed and released by the Division, any school can find out where it stands as a whole in relation to other schools of the state. Departments of instruction can find their rank in the state, and the departments of instruction may be compared within a single school. It is in this sense that the high schools themselves are tested.

That the schools welcome this testing service and find it valuable is shown by the fact that the number of tests sold has increased every year since 1934-35.

The Coordinated Science Curriculum for State Schools. In the University's report for 1942-43, mention was made that the astounding ignorance of physics and mathematics discovered among the citizens of the United States when the war most demanded knowledge of these subjects had led to the formation of an Indiana Chapter of the American Association of Physics Teachers and to a Committee on Teachers' Training. The work inaugurated by those committees has been continued and shows real accomplishment.

A physics teachers' guide covering the whole year's work for high schools has been prepared and published and is now being used in the Indiana high schools. The physical science curriculum containing both physics and chemistry has been brought up to date, and suggestions by the science teachers of the Indiana schools have been carried out. Preparation of source units based on the resources of the state and country are being continued, and special teaching units are being prepared. In co-operation with the local school systems, a special co-ordinated curriculum from the fourth to the twelfth grade in the sciences has been worked out, and a special workshop was conducted to make the teachers familiar with the project and to integrate their own experience into the pattern of experiment. Several of the units dealing with the biological sciences have been finished, and the work will be continued.

Public Safety Institute. In 1936 the Public Safety Institute was established as a division of the Engineering Extension Department of the University. Its purpose is to serve the people of Indiana in all matters concerning the conservation and protection of human life and property. The Institute, through training and research and various special services, tries to encourage wider use and development of scientific accident prevention and public safety activities. The staff of the Institute works with other schools and departments of the University and with various private and governmental agencies in conducting a continuing program of activities with police departments, fire departments, industrial plants, schools, and other groups and individuals concerned with public safety.

Safety and conservation are vital to a nation at war; consequently, the Institute's current program deals directly with the war problems of police and fire departments and industrial plant protection units.

The service and training program for police has included basic and advanced police training courses at the University and at various regional centers and, on an in-service basis, with practically every city police department in Indiana. The program also includes city-wide traffic enforcement and engineering surveys, in-service consultation and assistance to police officials, the installation of police record systems and accident-prevention bureaus, and studies and research on various police problems.

The Institute serves as a clearing house for information of value to all police departments. An interesting recognition of the value of the work came when the Automobile Protective and Information Bureau made a financial grant to allow this service to be extended to Iowa, Illinois, Ohio, Michigan, Minnesota, Kentucky, and South Dakota.

The Institute's industrial protection program is conducted in co-operation with the Indiana State Council of Civilian Defense and provides services and training for more than 400 Indiana war industries. Industrial protection training courses have been conducted at the University, at other regional centers throughout the state, and, on an in-service basis, in many industries. More than 3,200 industrial plant-protection officials and plant guards have attended these courses, and a monthly bulletin containing the latest information on developments in plant protection goes to more than 600 industries. A series of 20 training pamphlets discussing various plant-protection subjects has been prepared and used for training purposes.

During the year the Indiana fire-service training program was turned over to the Public Safety Institute by the Engineering Extension Department. This program provides for the training of fire-department instructors, in-service training for municipal and volunteer firemen, and the conducting of an annual state Fire School. Firemen from all parts of Indiana have received this training, and more than 500 fire chiefs and fire-department representatives have attended yearly fire schools.

General services in connection with all phases of public safety have been made available to schools, to city and state safety councils, to state and governmental agencies, and to community, civic, and professional clubs. The Institute has worked closely with the Indiana state police and the state motor vehicle bureau on the development of driver licensing and examining procedures, and annual retraining schools are held at the University for license examiners. In addition, at the request of the Fifth Service Command of the United States Army, the Institute co-operated in the organization and conducting of a state-wide safety conference, which was held in November, 1943. The Institute has given the schools much help in teaching public safety. It has conducted school safety surveys, given teacher-training courses in safety education, and arranged for talks to school assemblies and other general safety education activities.

The University Radio Station. The broadcasts from WBAA, the University radio, reach so many people within the state that little need be said about it. The station, of course, broadcasts news, concerts, and various entertainment features. But of especial interest to this report are the more educational broadcasts.

Every year the lectures of several professors on the campus are broadcast directly from the classroom. Other faculty programs were the following: "You and Your Speech," a series discussing speech problems and their correction; "Opera Memoirs," a program of opera music and stories from the operas; and a series on modern poetry. In addition, a faculty quiz featured competition between the various departments, with interesting and sometimes amusing results. A series of transcriptions entitled "You and Your Health," received from the State Department of Public Health, was broadcast. The Chinese Students' Club of Purdue carried two weekly programs on the station, one of current news from China and the other concerning Chinese culture and customs. A talented student conducted a 13-week series of programs entitled "This Is Indiana," in which he made on-the-spot recordings at various state institutions. In addition, a Homemakers Club of the Air broadcast useful hints to homemakers. But perhaps the most interesting series during the year was a discussion by eight or nine faculty members on various post-war problems.

The Musical Organizations of the University. On the campus are four musical organizations: the University Choir, made up of 200 voices; the Purduettes, consisting of thirteen girls; the Purdue University orchestra of fifty pieces; and the Purdue Glee Club of sixty men. These various organizations have proved themselves not only skilled and talented but highly popular and during the year have made a number of off-campus appearances.

To some the opportunity given to University students, both men and women, to appear in public to furnish entertainment to various groups may seem to have little to do with education. But one thing these annual reports of Purdue University have tried to stress is the value of giving maturing students the opportunity to develop their whole personality. Such extracurricular activities as music are particularly valuable. They require self-discipline and self-restraint and subordination of the individual to the success of a group. Besides that, of course, the public appearance of a group of students all devoted to making the best possible impression, both for themselves and for their university, demands a poise and self-control that few other activities on a university campus can so well develop.

The Bureau of Information. Perhaps such a report of a state institution as this, that has tried to stress the various ways in which that university serves the citizens of the state on and beyond the campus, may logically close with a reference to the work of the Bureau of Information. It is not enough that a university be ready to offer service: the people who can benefit by that service must know of it. And it is the function of the Bureau to keep the people of Indiana informed about what the University is doing, has done, and wants to do. In a report furnished by the Director of the Bureau of Information are the following significant paragraphs:

> Public educational institutions of the type of Purdue, dedicated to the training of youth on the campus and to an ever-expanding service to the citizenry beyond the campus, succeed only as the public knows about and appreciates what the University is doing and seeks to do. The accomplishments of the graduates and former students of Purdue, as for any other institution of higher learning, mean more than anything else in establishing public appreciation of the value of such training on the campus. Likewise, the effectiveness of the services performed for people off the campus determines the acceptance of the policies and teachings of an institution by the public at large.
>
> Regardless of how many students may come to the campus or how many persons may receive direct service off the campus, through personal contacts with staff members, the number necessarily is limited. The vast majority of the people in any state miss that direct, personal contact. Therefore, the only way to reach with service of any sort those people not given direct help is through the dissemination of news and information of value to them.
>
> The Bureau of Information, in fulfilling its function of interpreting the University to the people of the state and in extending the extension service, takes advantage of every known means of presenting information, the press, radio, exhibits, posters, photographic slides, motion pictures, etc.

In fulfilling its function, the Bureau of Information has contributed directly to whatever success has been gained by any of the agencies whose work has been described herein. The Bureau has sent out hundreds of stories on various phases of the agricultural program conducted by the University. It has publicized effectively all the various services rendered, by posters, by photographs, by stories to newspapers and broadcasting stations. It has said constantly to the citizens of Indiana: "Purdue University is your university; use it."

Appendices

THE BOARD OF TRUSTEES

By provision of the law passed in 1921, the governing board of the University consists of nine trustees, appointed by the Governor for terms of three years. Three of these trustees are to be appointed, upon the nomination of the Purdue Alumni Association, from the graduates of the institution residing in the state. One of these shall be a graduate of the School of Agriculture. Of the remaining six trustees, two shall be men of prominence and character in agricultural pursuits; two shall be men chiefly engaged in manufacturing industries; and two shall be citizens of character and distinction. One of these shall be a woman.

Board of Trustees

(as of July 1, 1944)

Name	*Term Expires*	*Year of First Appointment*
John A. Hillenbrand, Batesville	June 30, 1947	1913
Kathryn McHale, Logansport	June 30, 1946	1937
Paul B. Sturm, Dana	June 30, 1945	1938
*William A. Hanley, Indianapolis	June 30, 1945	1940
Allison E. Stuart, Lafayette	June 30, 1946	1940
*J. Ralph Thompson, Seymour	June 30, 1947	1941
Louis Ruthenburg, Evansville	June 30, 1945	1942
*Charles W. Cole, South Bend	June 30, 1946	1943
Guy H. Wilson, Kokomo	June 30, 1947	1944

Officers of the Board

John A. Hillenbrand	President
Allison E. Stuart	Vice-President
Frank C. Hockema	Secretary
Mary Elizabeth Skinner	Assistant Secretary
Burr S. Swezey	Treasurer
Brenton A. Devol	Legal Counsel

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* Elected by the Purdue Alumni Association.

THE REPORT OF THE REGISTRAR

This report covers the period from April 20, 1943, to June 25, 1944, and considers only those students whose records were kept in the Registrar's Office.

Because of the irregularity in the calendar, the enrollment figures are not arranged in the pattern used in previous years. The calendar for civilian students was itself sufficiently irregular, and superimposed upon it were special terms for the Army Specialized Training Program, the Navy College Training Program, and the Curtiss-Wright and R.C.A. Cadette Programs. The civilian calendar, beginning in November, was adjusted to coincide with the Navy program, and a semi-term of eight weeks for civilians was arranged for the interval between the close of the Summer Term in August and the beginning of the November Term. Table A gives the enrollment of all these terms in detail, with dates.

Table I gives a summary of the same facts in different form, somewhat resembling the form used in reports of earlier years. The classification is not so significant as in earlier years, since in the period considered a student's classification normally changed. Each student is counted as of the class in which he was enrolled in his last term.

The total number of individuals enrolled was 9,310, as compared with 8,359 in 1942-43. The total number of resident students was 9,002, as compared with 8,161. The number of undergraduates in civilian four-year plans of study (3½ terms) was 4,436, as compared with 6,914 (2 terms). The total number of freshmen in civilian plans of study was 1,548, as compared with 2,708.

Table II, except for the increased number of dates at which degrees were granted, is in the same form as in previous years. The total number of degrees granted was 1,053 as compared with 1,320 in the previous year.

Table III follows the pattern of previous years, with necessary adjustments.

TABLE A

ENROLLMENT BY TERMS

1. *Regular Civilian Students (Undergraduate, Special, Graduate)*

		Men	*Women*	*Total*
Summer Term	April 28-Aug. 14...	2,505	621	3,126
Civilians in Navy				
July Term	July 7-Oct. 23......	45	0	45
Semi-Term	Sept. 2-Oct. 27......	1,505	798	2,303
November Term	Nov. 8-Feb. 26........	1,588	1,206	2,794
March Term	Mar. 6-June 24.....	1,333	1,109	2,442
Total, excluding duplicates...........		3,518	1,619	5,137

2. *Army Specialized Training Program*

		Men	
First Term	Mar. 27-June 26....	107	
Second Term	July 12-Oct. 23.....	922	
Third Term	Nov. 8-Jan. 29......	1,348	Includes 67 reserves
Fourth Term	Feb. 7-April 29.....	1,189	Includes 70 reserves; all but reserves withdrawn Mar. 15.
Fifth Term	May 8-July 29......	13	All reserves
Total, excluding duplicates...........		2,132	

3. **Advanced Reserve Officers Training Corps*

		Men	
Semi-Term	Sept.-Oct.	185	Entered late in term.
November Term	Nov. 8-Feb. 26......	198	
March Term	March	20	Withdrawn early in term.
Total, excluding duplicates...........		200	

4. *Navy College Training Program*

		Men
July Term	July 7-Oct. 26......	1,263
November Term	Nov. 8-Feb. 26.....	1,251
March Term	Mar. 6-June 24.....	1,183
Total, excluding duplicates...........		1,683

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* These former students returned for further training were administratively a part of the A. S. T. P. but took courses under the civilian program.

5. *Curtiss-Wright Cadette Program*

		Women
First Term	Feb. 15-July 16.....	98
Second Term	July 16-Dec. 15.....	94
Total, excluding duplicates...........		98

6. *R. C. A. Cadette Program*

		Women
First Term	May 3-Oct. 5.......	86
Second Term	Oct. 5-Feb. 26......	77
Total, excluding duplicates...........		86

7. *Agricultural Winter School*

		Men	*Women*	*Total*
Total	Jan. 3-Feb. 25......	92	3	95

TOTAL	7,625	1,806	9,431
DUPLICATES	429		429
NET TOTAL.........................	7,196	1,806	9,002

TABLE I

Enrollment for the year 1943-44.................................. 9,310

RESIDENT STUDENTS

Summer Term, September Semi-Term, November and March Terms

In Four-Year Plans of Study	*Fresh-men*	*Sopho-mores and Second Year*	*Juniors and Third Year*	*Seniors and Fourth Year*	*Total*
Agriculture*	64	36	29	55	184
Engineering (Freshmen)	972	——	——	——	972
Chemical Engineering	——	111	81	120	312
Metallurgical Engineering	——	21	14	28	63
Civil Engineering	——	36	37	39	112
Electrical Engineering	——	119	100	122	341
Mechanical Engineering	——	285	144	218	647
Aeronautical Engineering	——	——	28	47	75
Public Service Engineering.......	——	9	10	9	28
Engineering-Law	——	1	——	——	1

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* Included under Agriculture are 28 students in Forestry.

Trade and Industrial Education	9	2	1	5	17
Pharmacy	41	20	8	37	106
Physical Education	12	9	6	7	34
Science	250	190	144	187	771
Home Economics	200	183	156	234	773
Total	1,548	1,022	758	1,108	4,436
In Special Work					
Special Students				172	
Army Specialized Training Program including Reserves and Advanced R. O. T. C.				2,332	
Navy College Training Program			1,683		
Less duplicates with Civilians			429	1,254	
Curtiss-Wright and R. C. A. Cadettes				184	
Winter School in Agriculture, 1944				95	
Graduate Students				529	
					4,566
TOTAL RESIDENT STUDENTS					9,002
Non-Resident Students					
Candidates for Professional Engineering Degrees				2	
Field Service Courses—Department of Education				73	
Engineering Extension Courses				25	
Technical Institutes				208	
TOTAL NON-RESIDENT STUDENTS					308

TABLE II

DEGREES CONFERRED 1943-44

Bachelor's Degrees	*Aug. 15 1943*	*Oct. 27 1943*	*Jan. 2 1944*	*Feb. 27 1944*	*Apr. 23 1944*	*June 25 1944*	*Total*
Bachelor of Science	61	5	13	17	3	38	137
B. S. in Home Economics	63	3	29	20	6	45	166
B. S. in Agriculture	26	3	3	4	3	3	42
B. S. in Forestry	4	2	..	1	..	..	7
B. S. in Chemical Engr.	65	6	5	12	1	32	121
B. S. in Metallurgical Engr.	16	2	..	6	..	5	29
B. S. in Civil Engr.	15	3	..	7	..	13	38
B. S. in Electrical Engr.	41	8	19	10	13	17	108
B. S. in Mechanical Engr.	95	9	14	32	10	27	187
B. S. in Aeronautical Engr.	23	1	1	..	1	8	34
B. S. in Public Service Engr.	5	2	..	2	..	..	9
B. S. in T. and I. Education	4	..	..	1	..	..	5
B. S. in Pharmacy	21	3	4	..	1	10	39
Bachelor of Physical Education	1	1	1	..	..	..	3
Total Bachelor's Degrees	440	48	89	112	38	198	925
Advanced Degrees							
Master of Science	12	..	2	11	2	5	32
M. S. in Home Economics	7	..	..	2	..	..	9
M. S. in Engineering	..	..	..	..	..	2	2
M. S. in Chemical Engr.	4	..	..	..	..	..	4
M. S. in Civil Engr.	2	..	..	..	..	..	2
M. S. in Electrical Engr.	1	..	..	1	..	..	2
M. S. in Mechanical Engr.	1	2	..	2	..	1	6
M. S. in Education	10	..	..	1	..	2	13
M. S. in Psychology	2	..	..	2	..	..	4
Civil Engineer	..	..	..	1	..	..	1
Doctor of Philosophy	8	3	4	14	1	15	45
Total Advanced Degrees	47	5	6	34	3	25	120
TOTAL DEGREES IN COURSE	487	53	95	146	41	223	1.045
Honorary Degrees	..	..	..	5	..	3	8

TABLE III

WOMEN STUDENTS ENROLLED 1939-44

	1943-44 **Consolidated*	*1942-43* *Fall and Winter*	*1941-42*	*1940-41*	*1939-40*
Freshmen	405	447	397	433	431
Sophomores and Second Year	338	314	376	360	337
Juniors and Third Year	267	210	257	268	231
Seniors and Fourth Year	382	362	249	225	235
Total Four-Year	1,392	1,333	1,279	1,286	1,234
Specials	112	54	61	98	154
Curtiss-Wright and R.C.A. Trainees	184	....	....	....	....
Resident Graduates	115	69	91	98	108
	1,803	1,456	1,431	1,482	1,496
Summer Session (Term) (excluding duplicates)	*	185	188	225	186
Agricultural Winter School	3	4	1	3	1
Total Resident Students	1,806	1,645	1,620	1,710	1,683
Field Service Courses in Education (excluding duplicates)	11	36	10	1	12
Technical Institutes	17	....	....	....	....
	1,834	1,681	1,630	1,711	1,695

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* The consolidated count for the year includes the Summer Term, the Semi-Term, the November and March Terms.

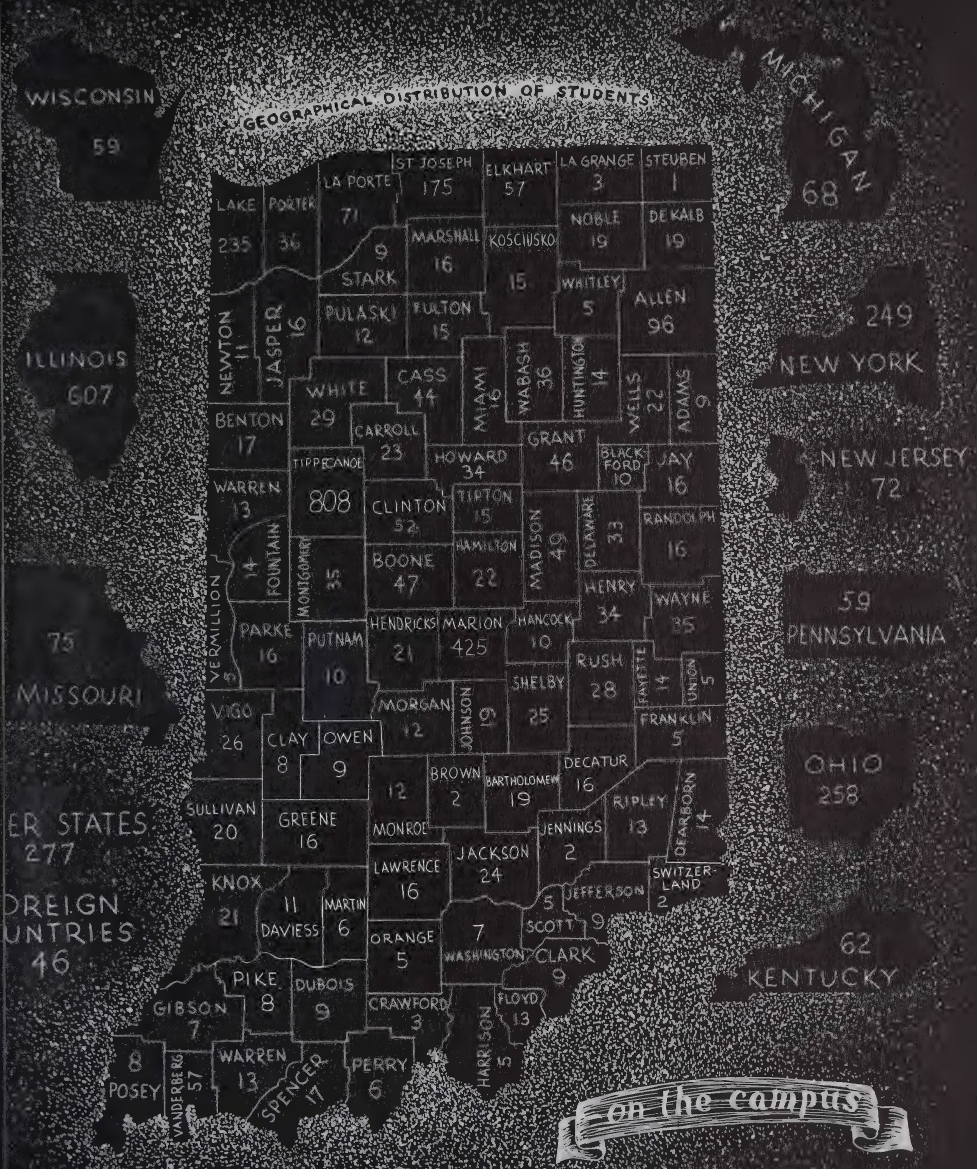
CONFERENCE ATTENDANCE

July, 1943-July, 1944

Date	*Type of Conference*	*Attendance*
July 5-9	Rural Leadership School	250
July 8-9	City and Town Superintendents Conference	55
July 12-24	Principals' Workshop	19
July 29-30	Industrial Training Conference	125
Aug. 19	School Superintendents-Industrialists Conference (on employment of youth in industry)	40
Sept. 17	Swine Day	850
Sept. 29	Post-War Planning Committee, Indiana Federation of Clubs	250
Sept. 29-30	State Poultry Association	350
Sept. 30-Oct. 1	4th Annual Animal Nutrition School	79
Oct. 1-2	Northern Indiana High-School Principals Association	39
Oct. 7-8	31st Annual Short Course for Veterinarians	260
Oct. 25-30	Industrial Recreation Clinic	92
Nov. 2-3-4	12th Parents Institute	200
Nov. 14-15	High-School Principals-Industrial Co-ordinators (work experience conference)	38
Nov. 19-30	Hatcherymen's Shortcourse	22
Nov. 19	Indiana Cattle Feeders' Association	400
Nov. 20	Guidance Conference	200
Dec. 7-10	Annual Conference of Indiana Agricultural Extension Service	249
Jan. 11-13	Agricultural Conference	2,798
Jan. 17-20	Pest Control Conference	125
Jan. 24-26	Thirtieth Annual Road School	668

Date	*Type of Conference*	*Attendance*
Feb. 1-5	Short Course on Life Insurance	39
Feb. 8-9	18th Annual Conference of Indiana Canners and Fieldmen	300
Feb. 7-12	Short Course on Life Insurance (second school)	52
Feb. 12	Five-County Teachers' Institute	350
Feb. 14-19	Short Course on Life Insurance (third school)	20
Jan. 2-Feb. 25	Eight-Week Winter Course in Agriculture	95
Feb. 21-22	"Refresher" School for Home Demonstration Agents	55
Feb. 24-25	Juvenile Delinquency Conference	104
Feb. 28-29	Sixth Annual Indiana Greenskeepers' Short Course	46
March 8	Annual Indiana Florists Conference	85
March 13-17	Short Course on Farm Power	30
March 24	Time and Motion Study of Industrial Operations (Clinic)	21
March 20-23	Short Course on Farm Power	30
April 3	War Food Emergency Assistants Training School	38
April 7-8	15th Annual State Convention of Indiana Future Farmers of America	350
April 14-15	13th Annual Football Clinic	250
April 22	Meeting of Association of Operative Millers	35
April 20	Plant Protection Conference	50
April 26-May 4	Short Course in Statistical Methods of Quality Control	60
April 26	Two-Weeks Short Course — How to Maintain High Standards of Manufacturing Products	
May 1-2	School Principals Work Shop	33
May 4-5-6	War Emergency Food Assistants Training School	36
May 17	Grain School	32

Date	*Type of Conference*	*Attendance*
May 17	Regional Conference of Social Workers	100
May 22	Mayors, School Superintendents, Selective Service Re-employment Committeemen—Conference on Care of Returning Veterans	52
May 29	Institute of Aeronautical Science, Student Branch Regional Meeting	50
June 12-14	26th Annual 4-H Club Round-Up	1,800
June 19-21	30th Annual Conference of Indiana Vocational Agriculture Teachers	200
June 23	Annual Spring Meeting of Indiana Cattle Feeders' Association	250
June 26	American Society of Farm Managers and Rural Appraisers Meeting	133
June 27-28	Soil Conservation School	25
TOTAL—	52 Conferences and Short Courses	11,830


GEOGRAPHICAL DISTRIBUTION OF STUDENTS

on the campus